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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This notebook provides an overview of the Manpower, Personnel and Training (MPT) program for FY84 and 85. It has been assembled for use of laboratory planners and managers and headquarters personnel in the Services and OSD.

DD FORM 1473 1 JAN 73 EDITION OF 1 NOV 65 IS OBSOLETE

NOTICE
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These pages entirely replace the FY83-84 edition
of the
Training and Personnel Systems Technology
(TPST)
R&D program description issued in April, 1983.

This program description is a product of the
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I. INTRODUCTION

This notebook is a reference document presenting a comprehensive overview of the Manpower, Personnel and Training (MPT) program for FY 84 and FY 85. It is a consolidation of Program Element and Project information brought together to serve as a management tool for laboratory managers and planners, and headquarters personnel in the services and OSD.

The notebook integrates narrative descriptions of the work being conducted by the laboratories, funding figures in the form of fiscal tables, and listings displaying a variety of information. It is flexible in nature and allows the managerial user to view, extract, and aggregate vital information for decision making and resource commitment.

Some work beyond the OUSD(R&E) MPT program is also included in this book. The manpower-related work being conducted by OASD(MI&L) is included in the book because of the need for close coordination between the two programs.

The notebook contains:

FISCAL TABLES (Section II)
This section contains a series of cross-tabulations featuring FY 84 and FY 85 funding figures by Congressional Categories, DoD organizations, Budget Categories, and MPT Goals.

PROGRAM ELEMENT AND PROJECT SYNOPSES (Section III)
This section contains a synopsis of each Program Element and its associated Projects, outlining the products and payoffs of that work.

OVERALL SYNOPSES AND PROJECT LISTINGS (Section IV)
This section contains synopses of the work being conducted by each service within each Congressional Category. Listings are provided of the Projects that fall within each category for each service.

MANPOWER, PERSONNEL AND TRAINING STUDIES (Section V)
This section contains listings of the OASD(MI&L)-sponsored Projects. The listings are organized by Program Element, Congressional Category, and Goal.

APPENDIXES (Section VI)

This section contains: (a) a list of the Congressional Categories and sub-categories, (b) a list of the Goals used for this generation of this book, (c) a list of the Projects to be completed in FY 84, (d) a list of the Projects to be initiated in FY 85, and (e) a selection of policy-level memoranda that impact the MPT program.

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II. FISCAL TABLES

NOTE: The percentages shown in each table may not total
          correctly due to rounding.

LIST OF ABBREVIATIONS USED IN FISCAL TABLES

Variable Name	Abbreviation	Used For
CONGRESSIONAL CATEGORY	ET	Education and Training
	HF	Human Factors
	MP	Manpower and Personnel
	ST	Simulation and Training Devices
DoD GOAL	1	Management Trade-offs
	2	Accession and Retention
	3	Unit Productivity
	4	Designing for System Readiness
	5	Improved Sustainability
	6	Training Systems
	VAR	Various (i.e., project applies to more than one goal)
BUDGET CATEGORY	6.1	Basic Research
	6.2	Exporatory Development
	6.3	Advanced Development
	6.4	Engineering Development
	6.5	Management and Support
	9.2	Headquarters Management
DoD ORGANIZATION	MI&L	OASD(MI&L)
	ARMY	Army
	NAVY	Navy and Marine Corps
	AF	Air Force

TABLE II-1

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

BUDGET CATEGORY BY DOD ORGANIZATION

1984 ($MILLIONS)

BUDGET CATEGORY

DOD ORGANIZATION	6.1	6.2	6.3	6.4	6.5	9.2	TOTAL
MI&L	.00	.00	.00	.00	2.53	4.19	6.72
(ROW%)	(0)	(0)	(0)	(0)	(38)	(62)	(100)
ARMY	5.20	23.62	39.10	31.26	.00	.00	99.19
(ROW%)	(5)	(24)	(39)	(32)	(0)	(0)	(100)
NAVY	9.92	12.99	15.60	42.52	.00	.00	81.02
(ROW%)	(12)	(16)	(19)	(52)	(0)	(0)	(100)
AF	5.52	44.03	13.33	23.24	.00	.00	86.1?
(ROW%)	(6)	(51)	(15)	(27)	(0)	(0)	(10'
TOTAL	20.64	80.64	68.03	97.02	2.53	4.19	27?
(ROW%)	(8)	(30)	(25)	(36)	(1)	(2)	(

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

BUDGET CATEGORY BY DOD ORGANIZATION

1985 ($MILLIONS)

BUDGET CATEGORY

DOD ORGANIZATION	6.1	6.2	6.3	6.4	6.5	9.2	TOTAL
MI&L	.00	.00	.00	.00	.80	3.10	3.90
(ROW%)	(0)	(0)	(0)	(0)	(20)	(80)	(100)
ARMY	7.21	28.68	59.02	56.40	.00	.00	151.32
(ROW%)	(5)	(19)	(39)	(37)	(0)	(0)	(100)
NAVY	12.53	14.42	33.33	42.29	.00	.00	102.58
(ROW%)	(12)	(14)	(32)	(41)	(0)	(0)	(100)
AF	5.68	47.89	18.18	93.90	.00	.00	165.68
(ROW%)	(3)	(29)	(11)	(57)	(0)	(0)	(100)
TOTAL	25.42	91.00	110.54	192.60	.80	3.10	423.46
(ROW%)	(6)	(21)	(26)	(45)	(0)	(1)	(100)

TABLE II-2

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1984 ($MILLIONS)

CONGRESSIONAL CATEGORY

DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.49	.00	6.23	.00	6.72
(ROW%)	(7)	(0)	(93)	(0)	(100)
ARMY	18.06	18.79	13.53	48.81	99.19
(ROW%)	(18)	(19)	(14)	(49)	(100)
NAVY	10.01	7.80	10.81	52.40	81.02
(ROW%)	(12)	(10)	(13)	(65)	(100)
AF	7.29	23.31	7.67	47.85	86.12
(ROW%)	(8)	(27)	(9)	(56)	(100)
TOTAL	35.86	49.90	38.24	149.06	273.06
(ROW%)	(13)	(18)	(14)	(55)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1985 ($MILLIONS)

CONGRESSIONAL CATEGORY

DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.40	.00	3.50	.00	3.90
(ROW%)	(10)	(0)	(90)	(0)	(100)
ARMY	25.25	27.96	21.59	76.51	151.32
(ROW%)	(17)	(18)	(14)	(51)	(100)
NAVY	24.68	9.15	14.50	54.25	102.58
(ROW%)	(24)	(9)	(14)	(53)	(100)
AF	8.12	29.44	10.09	118.01	165.66
(ROW%)	(5)	(18)	(6)	(71)	(100)
TOTAL	58.46	66.55	49.68	248.77	423.46
(ROW%)	(14)	(16)	(12)	(59)	(100)

TABLE II-3

**MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET**

**CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION**

1984 (\$MILLIONS)

DOD ORGANIZATION

PROGRAM ELEMENT	CONGRESSIONAL CATEGORY				
	ET	HF	MP	ST	TOTAL
MI&L					
85109D	.37	.00	2.16	.00	2.53
(ROW%)	(15)	(0)	(85)	(0)	(100)
92198D	.13	.00	4.07	.00	4.19
(ROW%)	(3)	(0)	(97)	(0)	(100)
MI&L TOTAL	.49	.00	6.23	.00	6.72
(ROW%)	(7)	(0)	(93)	(0)	(100)

II-3-1

TABLE II-3 (continued)

' 'T PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

PROGRAM ELEMENT	CONGRESSIONAL CATEGORY				
	ET	HF	MP	ST	TOTAL
ARMY					
61102A	.88	3.21	.76	.35	5.20
(ROW%)	(17)	(62)	(15)	(7)	(100)
62716A	.00	9.83	.00	.00	9.83
(ROW%)	(0)	(100)	(0)	(0)	(100)
62717A	.00	1.55	.00	2.33	3.88
(ROW%)	(0)	(40)	(0)	(60)	(100)
62722A	3.61	.00	2.95	.00	6.56
(ROW%)	(55)	(0)	(45)	(0)	(100)
62727A	.00	.00	.00	3.37	3.37
(ROW%)	(0)	(0)	(0)	(100)	(100)
63216A	.00	.00	.00	12.10	12.10
(ROW%)	(0)	(0)	(0)	(100)	(100)
63731A	.00	.00	9.83	.00	9.83
(ROW%)	(0)	(0)	(100)	(0)	(100)
63738A	.00	.00	.00	2.37	2.37
(ROW%)	(0)	(0)	(0)	(100)	(100)
63739A	.00	4.20	.00	.00	4.20
(ROW%)	(0)	(100)	(0)	(0)	(100)
63743A	7.57	.00	.00	.00	7.57
(ROW%)	(100)	(0)	(0)	(0)	(100)
63744A	.00	.00	.00	3.03	3.03
(ROW%)	(0)	(0)	(0)	(100)	(100)
64217A	.00	.00	.00	12.72	12.72
(ROW%)	(0)	(0)	(0)	(100)	(100)
64715A	.00	.00	.00	12.54	12.54
(ROW%)	(0)	(0)	(0)	(100)	(100)
64722A	6.00	.00	.00	.00	6.00
(ROW%)	(100)	(0)	(0)	(0)	(100)
ARMY TOTAL	18.06	18.79	13.53	48.81	99.19
(ROW%)	(18)	(19)	(14)	(49)	(100)

TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

PROGRAM ELEMENT	CONGRESSIONAL CATEGORY				
	ET	HF	MP	ST	TOTAL
NAVY					
61153N	4.32	2.79	2.81	.00	9.92
(ROW%)	(44)	(28)	(28)	(0)	(100)
62757N	.00	3.63	.00	3.68	7.31
(ROW%)	(0)	(50)	(0)	(50)	(100)
62763N	1.46	.19	4.03	.00	5.68
(ROW%)	(26)	(3)	(71)	(0)	(100)
63701N	.00	1.19	.00	.00	1.19
(ROW%)	(0)	(100)	(0)	(0)	(100)
63707N	.00	.00	1.81	.00	1.81
(ROW%)	(0)	(0)	(100)	(0)	(100)
63710N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
63720N	2.24	.00	.00	.00	2.24
(ROW%)	(100)	(0)	(0)	(0)	(100)
63727N	1.70	.00	.00	.00	1.70
(ROW%)	(100)	(0)	(0)	(0)	(100)
63732M	.29	.00	1.70	.11	2.11
(ROW%)	(14)	(0)	(81)	(5)	(100)
63733N	.00	.00	.00	6.56	6.56
(ROW%)	(0)	(0)	(0)	(100)	(100)
63739N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
64703N	.00	.00	.46	2.82	3.28
(ROW%)	(0)	(0)	(14)	(86)	(100)
64709N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
64714N	.00	.00	.00	11.59	11.59
(ROW%)	(0)	(0)	(0)	(100)	(100)
64715N	.00	.00	.00	27.07	27.07
(ROW%)	(0)	(0)	(0)	(100)	(100)
64716N	.00	.00	.00	.58	.58
(ROW%)	(0)	(0)	(0)	(100)	(100)
NAVY TOTAL	10.01	7.80	10.81	52.40	81.02
(ROW%)	(12)	(10)	(13)	(65)	(100)

TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

PROGRAM ELEMENT	ET	HF	MP	ST	TOTAL
AF					
61102F	.55	1.41	.00	3.56	5.52
(ROW%)	(10)	(26)	(0)	(64)	(100)
62202F	.00	14.55	.00	.00	14.55
(ROW%)	(0)	(100)	(0)	(0)	(100)
62205F	6.61	4.12	.00	11.74	22.48
(ROW%)	(29)	(18)	(0)	(52)	(100)
62703F	.00	.00	7.00	.00	7.00
(ROW%)	(0)	(0)	(100)	(0)	(100)
63106F	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
63227F	.00	.00	.00	6.73	6.73
(ROW%)	(0)	(0)	(0)	(100)	(100)
63231F	.00	1.30	.00	.00	1.30
(ROW%)	(0)	(100)	(0)	(0)	(100)
63365F	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
63704F	.13	.00	.67	.00	.80
(ROW%)	(16)	(0)	(84)	(0)	(100)
63751F	.00	1.92	.00	2.57	4.50
(ROW%)	(0)	(43)	(0)	(57)	(100)
64227F	.00	.00	.00	23.24	23.24
(ROW%)	(0)	(0)	(0)	(100)	(100)
AF TOTAL	7.29	23.31	7.67	47.85	86.12
(ROW%)	(8)	(27)	(9)	(56)	(100)
DOD TOTAL	35.86	49.90	38.24	149.06	273.06
(ROW%)	(13)	(18)	(14)	(55)	(100)

TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

| PROGRAM ELEMENT | CONGRESSIONAL CATEGORY | | | | |
	ET	HF	MP	ST	TOTAL
MI&L					
65109D	.25	.00	.55	.00	.80
(ROW%)	(31)	(0)	(69)	(0)	(100)
92198D	.15	.00	2.95	.00	3.10
(ROW%)	(5)	(0)	(95)	(0)	(100)
MI&L TOTAL	.40	.00	3.50	.00	3.90
(ROW%)	(10)	(0)	(90)	(0)	(100)

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TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

PROGRAM ELEMENT	ET	HF	MP	ST	TOTAL
ARMY					
61102A	1.50	4.21	1.00	.50	7.21
(ROW%)	(21)	(58)	(14)	(7)	(100)
62716A	.00	11.47	.00	.00	11.47
(ROW%)	(0)	(100)	(0)	(0)	(100)
62717A	.00	1.91	.00	2.87	4.78
(ROW%)	(0)	(40)	(0)	(60)	(100)
62722A	4.35	.00	3.56	.00	7.91
(ROW%)	(55)	(0)	(45)	(0)	(100)
62727A	.00	.00	.00	4.53	4.53
(ROW%)	(0)	(0)	(0)	(100)	(100)
63216A	.00	.00	.00	9.09	9.09
(ROW%)	(0)	(0)	(0)	(100)	(100)
63731A	.00	.00	17.03	.00	17.03
(ROW%)	(0)	(0)	(100)	(0)	(100)
63738A	.00	.00	.00	6.10	6.10
(ROW%)	(0)	(0)	(0)	(100)	(100)
63739A	.00	10.38	.00	.00	10.38
(ROW%)	(0)	(100)	(0)	(0)	(100)
63743A	11.66	.00	.00	.00	11.66
(ROW%)	(100)	(0)	(0)	(0)	(100)
63744A	.00	.00	.00	4.76	4.76
(ROW%)	(0)	(0)	(0)	(100)	(100)
64217A	.00	.00	.00	14.13	14.13
(ROW%)	(0)	(0)	(0)	(100)	(100)
64715A	.00	.00	.00	34.53	34.53
(ROW%)	(0)	(0)	(0)	(100)	(100)
64722A	7.74	.00	.00	.00	7.74
(ROW%)	(100)	(0)	(0)	(0)	(100)
ARMY TOTAL	25.25	27.96	21.59	76.51	151.32
(ROW%)	(17)	(18)	(14)	(51)	(100)

TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

PROGRAM ELEMENT	ET	HF	MP	ST	TOTAL
NAVY					
61153N	6.29	3.15	3.08	.00	12.53
(ROW%)	(50)	(25)	(25)	(0)	(100)
62757N	.00	4.13	.00	3.84	7.97
(ROW%)	(0)	(52)	(0)	(48)	(100)
62763N	1.81	.00	4.65	.00	6.46
(ROW%)	(28)	(0)	(72)	(0)	(100)
63701N	.00	1.86	.00	.00	1.86
(ROW%)	(0)	(100)	(0)	(0)	(100)
63707N	.00	.00	5.07	.00	5.07
(ROW%)	(0)	(0)	(100)	(0)	(100)
63710N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
63720N	5.06	.00	.00	.00	5.06
(ROW%)	(100)	(0)	(0)	(0)	(100)
63727N	10.53	.00	.00	.00	10.53
(ROW%)	(100)	(0)	(0)	(0)	(100)
63732M	.99	.00	1.69	.34	3.02
(ROW%)	(33)	(0)	(56)	(11)	(100)
63733N	.00	.00	.00	7.79	7.79
(ROW%)	(0)	(0)	(0)	(100)	(100)
63739N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
64703N	.00	.00	.00	6.50	6.50
(ROW%)	(0)	(0)	(0)	(100)	(100)
64709N	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
64714N	.00	.00	.00	3.13	3.13
(ROW%)	(0)	(0)	(0)	(100)	(100)
64715N	.00	.00	.00	32.17	32.17
(ROW%)	(0)	(0)	(0)	(100)	(100)
64716N	.00	.00	.00	.49	.49
(ROW%)	(0)	(0)	(0)	(100)	(100)
NAVY TOTAL	24.68	9.15	14.50	54.25	102.58
(ROW%)	(24)	(9)	(14)	(53)	(100)

TABLE II-3 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY PROGRAM ELEMENT
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

PROGRAM ELEMENT	ET	HF	MP	ST	TOTAL
AF					
61102F	.55	1.45	.00	3.68	5.68
(ROW%)	(10)	(25)	(0)	(65)	(100)
62202F	.00	15.85	.00	.00	15.85
(ROW%)	(0)	(100)	(0)	(0)	(100)
62205F	6.86	4.30	.00	12.13	23.28
(ROW%)	(29)	(18)	(0)	(52)	(100)
62703F	.00	.00	8.76	.00	8.76
(ROW%)	(0)	(0)	(100)	(0)	(100)
63106F	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
63227F	.00	.00	.00	6.40	6.40
(ROW%)	(0)	(0)	(0)	(100)	(100)
63231F	.00	3.96	.00	.00	3.96
(ROW%)	(0)	(100)	(0)	(0)	(100)
63385F	.00	.70	.00	.00	.70
(ROW%)	(0)	(100)	(0)	(0)	(100)
63704F	.71	.00	1.33	.00	2.04
(ROW%)	(35)	(0)	(65)	(0)	(100)
63751F	.00	3.18	.00	1.90	5.08
(ROW%)	(0)	(63)	(0)	(37)	(100)
64227F	.00	.00	.00	93.90	93.90
(ROW%)	(0)	(0)	(0)	(100)	(100)
AF TOTAL	8.12	29.44	10.09	118.01	165.66
(ROW%)	(5)	(18)	(6)	(71)	(100)
DOD TOTAL	58.46	66.55	49.68	248.77	423.46
(ROW%)	(14)	(16)	(12)	(59)	(100)

TABLE II-4

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY

1984 ($MILLIONS)

		CONGRESSIONAL CATEGORY			
BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
6.1	5.75	7.41	3.57	3.91	20.64
(ROW%)	(28)	(36)	(17)	(19)	(100)
6.2	11.68	33.87	13.98	21.11	80.64
(ROW%)	(14)	(42)	(17)	(26)	(100)
6.3	11.93	8.62	14.00	33.47	68.03
(ROW%)	(18)	(13)	(21)	(49)	(100)
6.4	6.00	.00	.46	90.56	97.02
(ROW%)	(6)	(0)	(0)	(93)	(100)
6.5	.37	.00	2.16	.00	2.53
(ROW%)	(15)	(0)	(85)	(0)	(100)
9.2	.13	.00	4.07	.00	4.19
(ROW%)	(3)	(0)	(97)	(0)	(100)
TOTAL	35.86	49.90	38.24	149.06	273.06
(ROW%)	(13)	(18)	(14)	(55)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY

1985 ($MILLIONS)

		CONGRESSIONAL CATEGORY			
BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
6.1	8.34	8.81	4.08	4.18	25.42
(ROW%)	(33)	(35)	(16)	(16)	(100)
6.2	13.02	37.66	16.97	23.36	91.00
(ROW%)	(14)	(41)	(19)	(26)	(100)
6.3	28.96	20.08	25.12	36.38	110.54
(ROW%)	(26)	(18)	(23)	(33)	(100)
6.4	7.74	.00	.00	184.86	192.60
(ROW%)	(4)	(0)	(0)	(96)	(100)
6.5	.25	.00	.55	.00	.80
(ROW%)	(31)	(0)	(69)	(0)	(100)
9.2	.15	.00	2.95	.00	3.10
(ROW%)	(5)	(0)	(95)	(0)	(100)
TOTAL	58.46	66.55	49.68	248.77	423.46
(ROW%)	(14)	(16)	(12)	(59)	(100)

TABLE II-5

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
MI&L					
6.1	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.5	.37	.00	2.16	.00	2.53
(ROW%)	(15)	(0)	(85)	(0)	(100)
9.2	.13	.00	4.07	.00	4.19
(ROW%)	(3)	(0)	(97)	(0)	(100)
MI&L TOTAL	.49	.00	6.23	.00	6.72
(ROW%)	(7)	(0)	(93)	(0)	(100)

II-5-1

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
ARMY					
6.1	.88	3.21	.76	.35	5.20
(ROW%)	(17)	(62)	(15)	(7)	(100)
6.2	3.61	11.38	2.95	5.69	23.62
(ROW%)	(15)	(48)	(12)	(24)	(100)
6.3	7.57	4.20	9.83	17.50	39.10
(ROW%)	(19)	(11)	(25)	(45)	(100)
6.4	6.00	.00	.00	25.26	31.26
(ROW%)	(19)	(0)	(0)	(81)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	18.06	18.79	13.53	48.81	99.19
(ROW%)	(18)	(19)	(14)	(49)	(100)

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
NAVY					
6.1	4.32	2.79	2.81	.00	9.92
(ROW%)	(44)	(28)	(28)	(0)	(100)
6.2	1.46	3.82	4.03	3.68	12.99
(ROW%)	(11)	(29)	(31)	(28)	(100)
6.3	4.23	1.19	3.51	6.67	15.60
(ROW%)	(27)	(8)	(22)	(43)	(100)
6.4	.00	.00	.46	42.05	42.52
(ROW%)	(0)	(0)	(1)	(99)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	10.01	7.80	10.81	52.40	81.02
(ROW%)	(12)	(10)	(13)	(65)	(100)

II-5-3

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
AF					
6.1	.55	1.41	.00	3.56	5.52
(ROW%)	(10)	(26)	(0)	(64)	(100)
6.2	6.61	18.67	7.00	11.74	44.03
(ROW%)	(15)	(42)	(16)	(27)	(100)
6.3	.13	3.22	.67	9.31	13.33
(ROW%)	(1)	(24)	(5)	(70)	(100)
6.4	.00	.00	.00	23.24	23.24
(ROW%)	(0)	(0)	(0)	(100)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	7.29	23.31	7.67	47.85	86.12
(ROW%)	(8)	(27)	(9)	(56)	(100)
DOD TOTAL	35.86	49.90	38.24	149.06	273.06
(ROW%)	(13)	(18)	(14)	(55)	(100)

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
MI&L					
6.1	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
6.5	.25	.00	.55	.00	.80
(ROW%)	(31)	(0)	(69)	(0)	(100)
9.2	.15	.00	2.95	.00	3.10
(ROW%)	(5)	(0)	(95)	(0)	(100)
MI&L TOTAL	.40	.00	3.50	.00	3.90
(ROW%)	(10)	(0)	(80)	(0)	(100)

CONGRESSIONAL CATEGORY

II-5-5

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
ARMY					
6.1	1.50	4.21	1.00	.50	7.21
(ROW%)	(21)	(58)	(14)	(7)	(100)
6.2	4.35	13.38	3.56	7.39	28.68
(ROW%)	(15)	(47)	(12)	(26)	(100)
6.3	11.66	10.38	17.03	19.96	59.02
(ROW%)	(20)	(18)	(29)	(34)	(100)
6.4	7.74	.00	.00	48.66	56.40
(ROW%)	(14)	(0)	(0)	(86)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	25.25	27.96	21.59	76.51	151.32
(ROW%)	(17)	(18)	(14)	(51)	(100)

II-5-6

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
NAVY					
6.1	6.29	3.15	3.08	.00	12.53
(ROW%)	(50)	(25)	(25)	(0)	(100)
6.2	1.81	4.13	4.65	3.84	14.42
(ROW%)	(13)	(29)	(32)	(27)	(100)
6.3	16.59	1.86	6.76	8.12	33.33
(ROW%)	(50)	(6)	(20)	(24)	(100)
6.4	.00	.00	.00	42.29	42.29
(ROW%)	(0)	(0)	(0)	(100)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	24.68	9.15	14.50	54.25	102.58
(ROW%)	(24)	(9)	(14)	(53)	(100)

TABLE II-5 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

CONGRESSIONAL CATEGORY BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

CONGRESSIONAL CATEGORY

BUDGET CATEGORY	ET	HF	MP	ST	TOTAL
AF					
6.1	.55	1.45	.00	3.68	5.68
(ROW%)	(10)	(26)	(0)	(65)	(100)
6.2	6.86	20.15	8.76	12.13	47.89
(ROW%)	(14)	(42)	(18)	(25)	(100)
6.3	.71	7.84	1.33	8.30	18.18
(ROW%)	(4)	(43)	(7)	(46)	(100)
6.4	.00	.00	.00	93.90	93.90
(ROW%)	(0)	(0)	(0)	(100)	(100)
6.5	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	8.12	29.44	10.09	118.01	165.66
(ROW%)	(5)	(18)	(6)	(71)	(100)
DOD TOTAL	58.46	66.55	49.68	248.77	423.46
(ROW%)	(14)	(16)	(12)	(59)	(100)

TABLE II-6

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY

1984 ($MILLIONS)

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
6.1	.00	2.69	.88	7.76	.00	9.31	.00	20.64
(ROW%)	(0)	(13)	(4)	(38)	(0)	(45)	(0)	(100)
6.2	.63	9.54	.00	24.88	.00	26.33	19.26	80.64
(ROW%)	(1)	(12)	(0)	(31)	(0)	(33)	(24)	(100)
6.3	1.70	12.13	1.04	7.92	1.70	43.54	.00	68.03
(ROW%)	(3)	(18)	(2)	(12)	(2)	(64)	(0)	(100)
6.4	.00	.46	.00	.00	.00	96.56	.00	97.02
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.45	.84	.64	.00	.22	.37	.00	2.53
(ROW%)	(18)	(33)	(25)	(0)	(9)	(15)	(0)	(100)
9.2	1.00	2.55	.19	.00	.32	.13	.00	4.19
(ROW%)	(24)	(61)	(5)	(0)	(8)	(3)	(0)	(100)
TOTAL	3.79	28.21	2.75	40.56	2.25	176.24	19.26	273.06
(ROW%)	(1)	(10)	(1)	(15)	(1)	(65)	(7)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY

1985 ($MILLIONS)

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
6.1	.00	3.20	.89	9.31	.00	12.02	.00	25.42
(ROW%)	(0)	(13)	(3)	(37)	(0)	(47)	(0)	(100)
6.2	1.15	11.77	.00	28.16	.00	29.81	20.11	91.00
(ROW%)	(1)	(13)	(0)	(31)	(0)	(33)	(22)	(100)
6.3	1.69	23.34	.13	18.40	11.51	55.46	.00	110.54
(ROW%)	(2)	(21)	(0)	(17)	(10)	(50)	(0)	(100)
6.4	.00	.00	.00	.00	.00	192.60	.00	192.60
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.15	.00	.30	.00	.10	.25	.00	.80
(ROW%)	(19)	(0)	(38)	(0)	(12)	(31)	(0)	(100)
9.2	.55	1.72	.00	.00	.67	.15	.00	3.10
(ROW%)	(18)	(56)	(0)	(0)	(22)	(5)	(0)	(100)
TOTAL	3.54	40.04	1.32	55.87	12.29	290.29	20.11	423.46
(ROW%)	(1)	(9)	(0)	(13)	(3)	(69)	(5)	(100)

TABLE II-7

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
MI&L								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.45	.84	.64	.00	.22	.37	.00	2.53
(ROW%)	(18)	(33)	(25)	(0)	(9)	(15)	(0)	(100)
9.2	1.00	2.55	.19	.00	.32	.13	.00	4.19
(ROW%)	(24)	(61)	(5)	(0)	(8)	(3)	(0)	(100)
MI&L TOTAL	1.45	3.39	.83	.00	.55	.49	.00	6.72
(ROW%)	(22)	(50)	(12)	(0)	(8)	(7)	(0)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 (SMILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.78	.00	3.56	.00	.88	.00	5.20
(ROW%)	(0)	(15)	(0)	(68)	(0)	(17)	(0)	(100)
6.2	.00	2.95	.00	11.38	.00	9.30	.00	23.62
(ROW%)	(0)	(12)	(0)	(48)	(0)	(39)	(0)	(100)
6.3	.00	9.83	.00	4.20	.00	25.07	.00	39.10
(ROW%)	(0)	(25)	(0)	(11)	(0)	(64)	(0)	(100)
6.4	.00	.00	.00	.00	.00	31.26	.00	31.26
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	13.53	.00	19.14	.00	66.52	.00	99.19
(ROW%)	(0)	(14)	(0)	(19)	(0)	(67)	(0)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL

NAVY

6.1	.00	1.93	.88	2.79	.00	4.32	.00	9.92
(ROW%)	(0)	(19)	(9)	(28)	(0)	(44)	(0)	(100)
6.2	.00	4.22	.00	3.63	.00	5.14	.00	12.99
(ROW%)	(0)	(33)	(0)	(28)	(0)	(40)	(0)	(100)
6.3	1.70	1.81	.00	1.19	1.70	9.20	.00	15.60
(ROW%)	(11)	(12)	(0)	(8)	(11)	(59)	(0)	(100)
6.4	.00	.46	.00	.00	.00	42.05	.00	42.52
(ROW%)	(0)	(1)	(0)	(0)	(0)	(99)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	1.70	8.42	.88	7.61	1.70	60.71	.00	81.02
(ROW%)	(2)	(10)	(1)	(9)	(2)	(75)	(0)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	1.41	.00	4.11	.00	5.52
(ROW%)	(0)	(0)	(0)	(26)	(0)	(74)	(0)	(100)
6.2	.63	2.37	.00	9.87	.00	11.89	19.26	44.03
(ROW%)	(1)	(5)	(0)	(22)	(0)	(27)	(44)	(100)
6.3	.00	.50	1.04	2.52	.00	9.27	.00	13.33
(ROW%)	(0)	(4)	(8)	(19)	(0)	(70)	(0)	(100)
6.4	.00	.00	.00	.00	.00	23.24	.00	23.24
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
8.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.63	2.87	1.04	13.81	.00	48.52	19.26	86.12
(ROW%)	(1)	(3)	(1)	(16)	(0)	(56)	(22)	(100)
DOD TOTAL	3.78	28.21	2.75	40.56	2.25	176.24	19.26	273.06
(ROW%)	(1)	(10)	(1)	(15)	(1)	(65)	(7)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
MI&L								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.15	.00	.30	.00	.10	.25	.00	.80
(ROW%)	(19)	(0)	(38)	(0)	(12)	(31)	(0)	(100)
9.2	.55	1.72	.00	.00	.67	.15	.00	3.10
(ROW%)	(18)	(56)	(0)	(0)	(22)	(5)	(0)	(100)
MI&L TOTAL	.70	1.72	.30	.00	.77	.40	.00	3.90
(ROW%)	(18)	(44)	(8)	(0)	(20)	(10)	(0)	(100)

II-7-5

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	1.00	.00	4.71	.00	1.50	.00	7.21
(ROW%)	(0)	(14)	(0)	(65)	(0)	(21)	(0)	(100)
6.2	.00	3.56	.00	13.38	.00	11.75	.00	28.68
(ROW%)	(0)	(12)	(0)	(47)	(0)	(41)	(0)	(100)
6.3	.00	17.03	.00	10.38	.00	31.62	.00	59.02
(ROW%)	(0)	(29)	(0)	(18)	(0)	(54)	(0)	(100)
6.4	.00	.00	.00	.00	.00	56.40	.00	56.40
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	21.59	.00	28.46	.00	101.27	.00	151.32
(ROW%)	(0)	(14)	(0)	(19)	(0)	(67)	(0)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	2.20	.89	3.15	.00	6.29	.00	12.53
(ROW%)	(0)	(18)	(7)	(25)	(0)	(50)	(0)	(100)
6.2	.00	4.65	.00	4.13	.00	5.64	.00	14.42
(ROW%)	(0)	(32)	(0)	(29)	(0)	(39)	(0)	(100)
6.3	1.69	5.07	.00	1.86	10.53	14.18	.00	33.33
(ROW%)	(5)	(15)	(0)	(6)	(32)	(43)	(0)	(100)
6.4	.00	.00	.00	.00	.00	42.29	.00	42.29
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	1.69	11.92	.89	9.15	10.53	68.40	.00	102.58
(ROW%)	(2)	(12)	(1)	(9)	(10)	(67)	(0)	(100)

TABLE II-7 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	1.45	.00	4.23	.00	5.68
(ROW%)	(0)	(0)	(0)	(26)	(0)	(74)	(0)	(100)
6.2	1.15	3.56	.00	10.65	.00	12.42	20.11	47.89
(ROW%)	(2)	(7)	(0)	(22)	(0)	(26)	(42)	(100)
6.3	.00	1.24	.13	6.16	.98	9.67	.00	18.18
(ROW%)	(0)	(7)	(1)	(34)	(5)	(53)	(0)	(100)
6.4	.00	.00	.00	.00	.00	93.90	.00	93.90
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	1.15	4.81	.13	18.26	.98	120.22	20.11	165.66
(ROW%)	(1)	(3)	(0)	(11)	(1)	(73)	(12)	(100)
DOD TOTAL	3.54	40.04	1.32	55.87	12.29	290.29	20.11	423.46
(ROW%)	(1)	(9)	(0)	(13)	(3)	(69)	(5)	(100)

TABLE II-8

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
MI&L								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.37	.00	.37
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.13	.00	.13
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
MI&L TOTAL	.00	.00	.00	.00	.00	.49	.00	.49
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL

ARMY

	1	2	3	4	5	6	VAR	TOTAL
6.1	.00	.00	.00	.00	.00	.88	.00	.88
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	3.61	.00	3.61
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	7.57	.00	7.57
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	6.00	.00	6.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	.00	.00	18.06	.00	18.06
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

II-8-2

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL 1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	.00	.00	4.32	.00	4.32
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	1.46	.00	1.46
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	1.70	2.53	.00	4.23
(ROW%)	(0)	(0)	(0)	(0)	(40)	(60)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	.00	1.70	8.31	.00	10.01
(ROW%)	(0)	(0)	(0)	(0)	(17)	(83)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	.55	.00	.55
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	5.00	1.61	6.61
(ROW%)	(0)	(0)	(0)	(0)	(0)	(76)	(24)	(100)
6.3	.00	.00	.00	.00	.00	.13	.00	.13
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.00	.00	.00	5.67	1.61	7.29
(ROW%)	(0)	(0)	(0)	(0)	(0)	(79)	(22)	(100)
DOD TOTAL	.00	.00	.00	.00	1.70	32.54	1.61	35.86
(ROW%)	(0)	(0)	(0)	(0)	(5)	(91)	(5)	(100)

II-8-4

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL						VAR	TOTAL
	1	2	3	4	5	6		
MI&L								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.25	.00	.25
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.15	.00	.15
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
MI&L TOTAL	.00	.00	.00	.00	.00	.40	.00	.40
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

II-8-5

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

| BUDGET CATEGORY | DOD GOAL | | | | | | | |
	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.00	.00	.00	.00	1.50	.00	1.50
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	4.35	.00	4.35
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	11.66	.00	11.66
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	7.74	.00	7.74
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	.00	.00	25.25	.00	25.25
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

II-8-6

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

| BUDGET CATEGORY | DOD GOAL | | | | | | | |
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	.00	.00	6.29	.00	6.29
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	1.81	.00	1.81
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	10.53	6.05	.00	16.59
(ROW%)	(0)	(0)	(0)	(0)	(64)	(36)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	.00	10.53	14.15	.00	24.68
(ROW%)	(0)	(0)	(0)	(0)	(43)	(57)	(0)	(100)

II-8-7

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ET

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL 1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	.55	.00	.55
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	5.22	1.64	6.86
(ROW%)	(0)	(0)	(0)	(0)	(0)	(76)	(24)	(100)
6.3	.00	.00	.00	.00	.00	.71	.00	.71
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.00	.00	.00	6.48	1.64	8.12
(ROW%)	(0)	(0)	(0)	(0)	(0)	(80)	(20)	(100)
DOD TOTAL	.00	.00	.00	.00	10.53	46.28	1.64	58.46
(ROW%)	(0)	(0)	(0)	(0)	(18)	(79)	(3)	(100)

II-8-8

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.00	.00	3.21	.00	.00	.00	3.21
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	11.38	.00	.00	.00	11.38
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	4.20	.00	.00	.00	4.20
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	18.79	.00	.00	.00	18.79
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)

II-8-9

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	2.79	.00	.00	.00	2.79
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.19	.00	3.63	.00	.00	.00	3.82
(ROW%)	(0)	(5)	(0)	(95)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	1.19	.00	.00	.00	1.19
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.19	.00	7.61	.00	.00	.00	7.80
(ROW%)	(0)	(2)	(0)	(98)	(0)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	1.41	.00	.00	.00	1.41
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	9.87	.00	.00	8.80	18.67
(ROW%)	(0)	(0)	(0)	(53)	(0)	(0)	(47)	(100)
6.3	.00	.00	.00	2.52	.00	.70	.00	3.22
(ROW%)	(0)	(0)	(0)	(78)	(0)	(22)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.00	13.81	.00	.70	8.80	23.31
(ROW%)	(0)	(0)	(0)	(59)	(0)	(3)	(38)	(100)
DOD TOTAL	.00	.19	.00	40.21	.00	.70	8.80	49.90
(ROW%)	(0)	(0)	(0)	(81)	(0)	(1)	(18)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.00	.00	4.21	.00	.00	.00	4.21
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	13.38	.00	.00	.00	13.38
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	10.38	.00	.00	.00	10.38
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	27.96	.00	.00	.00	27.96
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	3.15	.00	.00	.00	3.15
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	4.13	.00	.00	.00	4.13
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	1.86	.00	.00	.00	1.86
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	9.15	.00	.00	.00	9.15
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)

II-8-13

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = HF

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	1.45	.00	.00	.00	1.45
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	10.65	.00	.00	9.50	20.15
(ROW%)	(0)	(0)	(0)	(53)	(0)	(0)	(47)	(100)
6.3	.00	.00	.00	6.16	.98	.70	.00	7.84
(ROW%)	(0)	(0)	(0)	(79)	(13)	(9)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.00	18.26	.98	.70	9.50	29.44
(ROW%)	(0)	(0)	(0)	(62)	(3)	(2)	(32)	(100)
DOD TOTAL	.00	.00	.00	55.37	.98	.70	9.50	66.55
(ROW%)	(0)	(0)	(0)	(83)	(1)	(1)	(14)	(100)

TABLE II-8 (continued)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		1	2	3	4	5	6	VAR	TOTAL
MI&L									
6.1		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5		.45	.84	.64	.00	.22	.00	.00	2.16
	(ROW%)	(21)	(39)	(30)	(0)	(10)	(0)	(0)	(100)
9.2		1.00	2.55	.19	.00	.32	.00	.00	4.07
	(ROW%)	(25)	(63)	(5)	(0)	(8)	(0)	(0)	(100)
MI&L TOTAL		1.45	3.39	.83	.00	.55	.00	.00	6.23
	(ROW%)	(23)	(55)	(13)	(0)	(9)	(0)	(0)	(100)

DOD GOAL

II-8-15

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.76	.00	.00	.00	.00	.00	.76
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	2.95	.00	.00	.00	.00	.00	2.95
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	9.83	.00	.00	.00	.00	.00	9.83
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.C	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	13.53	.00	.00	.00	.00	.00	13.53
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)

II-8-18

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	1.93	.88	.00	.00	.00	.00	2.81
(ROW%)	(0)	(69)	(31)	(0)	(0)	(0)	(0)	(100)
6.2	.00	4.03	.00	.00	.00	.00	.00	4.03
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	1.70	1.81	.00	.00	.00	.00	.00	3.51
(ROW%)	(49)	(51)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.46	.00	.00	.00	.00	.00	.46
(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	1.70	8.23	.88	.00	.00	.00	.00	10.81
(ROW%)	(16)	(76)	(8)	(0)	(0)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.63	2.37	.00	.00	.00	.00	4.00	7.00
(ROW%)	(9)	(34)	(0)	(0)	(0)	(0)	(57)	(100)
6.3	.00	.50	.17	.00	.00	.00	.00	.67
(ROW%)	(0)	(75)	(25)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.63	2.87	.17	.00	.00	.00	4.00	7.67
(ROW%)	(8)	(37)	(2)	(0)	(0)	(0)	(52)	(100)
DOD TOTAL	3.79	28.02	1.88	.00	.55	.00	4.00	38.24
(ROW%)	(10)	(73)	(5)	(0)	(1)	(0)	(10)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL
MI&L								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.3	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.15	.00	.30	.00	.10	.00	.00	.55
(ROW%)	(27)	(0)	(55)	(0)	(18)	(0)	(0)	(100)
9.2	.55	1.72	.00	.00	.67	.00	.00	2.95
(ROW%)	(19)	(58)	(0)	(0)	(23)	(0)	(0)	(100)
MI&L TOTAL	.70	1.72	.30	.00	.77	.00	.00	3.50
(ROW%)	(20)	(49)	(9)	(0)	(22)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		1	2	3	4	5	6	VAR	TOTAL
ARMY									
6.1		.00	1.00	.00	.00	.00	.00	.00	1.00
	(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.2		.00	3.56	.00	.00	.00	.00	.00	3.56
	(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.3		.00	17.03	.00	.00	.00	.00	.00	17.03
	(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.4		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL		.00	21.59	.00	.00	.00	.00	.00	21.59
	(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		DOD GOAL							
		1	2	3	4	5	6	VAR	TOTAL
NAVY									
6.1		.00	2.20	.89	.00	.00	.00	.00	3.08
	(ROW%)	(0)	(71)	(29)	(0)	(0)	(0)	(0)	(100)
6.2		.00	4.65	.00	.00	.00	.00	.00	4.65
	(ROW%)	(0)	(100)	(0)	(0)	(0)	(0)	(0)	(100)
6.3		1.69	5.07	.00	.00	.00	.00	.00	6.76
	(ROW%)	(25)	(75)	(0)	(0)	(0)	(0)	(0)	(100)
6.4		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL		1.69	11.92	.89	.00	.00	.00	.00	14.50
	(ROW%)	(12)	(82)	(6)	(0)	(0)	(0)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = MP

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	1.15	3.56	.00	.00	.00	.00	4.04	8.76
(ROW%)	(13)	(41)	(0)	(0)	(0)	(0)	(46)	(100)
6.3	.00	1.24	.09	.00	.00	.00	.00	1.33
(ROW%)	(0)	(93)	(7)	(0)	(0)	(0)	(0)	(100)
6.4	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	1.15	4.81	.09	.00	.00	.00	4.04	10.09
(ROW%)	(11)	(48)	(1)	(0)	(0)	(0)	(40)	(100)
DOD TOTAL	3.54	40.04	1.28	.00	.77	.00	4.04	49.68
(ROW%)	(7)	(81)	(3)	(0)	(2)	(0)	(8)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

DOD GOAL

BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.00	.00	.35	.00	.00	.00	.35
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	5.69	.00	5.69
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	17.50	.00	17.50
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	25.26	.00	25.26
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	.35	.00	48.45	.00	48.81
(ROW%)	(0)	(0)	(0)	(1)	(0)	(99)	(0)	(100)

II-8-23

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

| BUDGET CATEGORY | DOD GOAL | | | | | | | |
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	3.68	.00	3.68
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	6.67	.00	6.67
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	42.05	.00	42.05
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	.00	.00	52.40	.00	52.40
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

II-8-24

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY		1	2	3	4	5	6	VAR	TOTAL
AF									
6.1		.00	.00	.00	.00	.00	3.56	.00	3.56
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2		.00	.00	.00	.00	.00	6.90	4.84	11.74
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(59)	(41)	(100)
6.3		.00	.00	.87	.00	.00	8.44	.00	9.31
	(ROW%)	(0)	(0)	(9)	(0)	(0)	(91)	(0)	(100)
6.4		.00	.00	.00	.00	.00	23.24	.00	23.24
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2		.00	.00	.00	.00	.00	.00	.00	.00
	(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL		.00	.00	.87	.00	.00	42.14	4.84	47.85
	(ROW%)	(0)	(0)	(2)	(0)	(0)	(88)	(10)	(100)
DOD TOTAL		.00	.00	.87	.35	.00	143.00	4.84	149.06
	(ROW%)	(0)	(0)	(1)	(0)	(0)	(96)	(3)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

| | | DOD GOAL | | | | | | |
BUDGET CATEGORY	1	2	3	4	5	6	VAR	TOTAL
ARMY								
6.1	.00	.00	.00	.50	.00	.00	.00	.50
(ROW%)	(0)	(0)	(0)	(100)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	7.39	.00	7.39
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	19.96	.00	19.96
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	48.66	.00	48.66
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
ARMY TOTAL	.00	.00	.00	.50	.00	76.01	.00	76.51
(ROW%)	(0)	(0)	(0)	(1)	(0)	(99)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL 1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	3.84	.00	3.84
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	8.12	.00	8.12
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	42.29	.00	42.29
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	.00	.00	54.25	.00	54.25
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

| BUDGET CATEGORY | DOD GOAL | | | | | | | |
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	3.68	.00	3.68
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	7.20	4.93	12.13
(ROW%)	(0)	(0)	(0)	(0)	(0)	(59)	(41)	(100)
6.3	.00	.00	.04	.00	.00	8.26	.00	8.30
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	93.90	.00	93.90
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.04	.00	.00	113.05	4.93	118.01
(ROW%)	(0)	(0)	(0)	(0)	(0)	(96)	(4)	(100)
DOD TOTAL	.00	.00	.04	.50	.00	243.31	4.93	248.77
(ROW%)	(0)	(0)	(0)	(0)	(0)	(98)	(2)	(100)

TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
NAVY								
6.1	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
6.2	.00	.00	.00	.00	.00	3.84	.00	3.84
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.3	.00	.00	.00	.00	.00	8.12	.00	8.12
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	42.29	.00	42.29
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
NAVY TOTAL	.00	.00	.00	.00	.00	54.25	.00	54.25
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)

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TABLE II-8 (continued)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR CONGRESSIONAL CATEGORY = ST

DOD GOAL BY BUDGET CATEGORY
WITHIN DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION

BUDGET CATEGORY	DOD GOAL							
	1	2	3	4	5	6	VAR	TOTAL
AF								
6.1	.00	.00	.00	.00	.00	3.68	.00	3.68
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.2	.00	.00	.00	.00	.00	7.20	4.93	12.13
(ROW%)	(0)	(0)	(0)	(0)	(0)	(59)	(41)	(100)
6.3	.00	.00	.04	.00	.00	8.26	.00	8.30
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.4	.00	.00	.00	.00	.00	93.90	.00	93.90
(ROW%)	(0)	(0)	(0)	(0)	(0)	(100)	(0)	(100)
6.5	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
9.2	.00	.00	.00	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(100)
AF TOTAL	.00	.00	.04	.00	.00	113.05	4.93	118.01
(ROW%)	(0)	(0)	(0)	(0)	(0)	(96)	(4)	(100)
DOD TOTAL	.00	.00	.04	.50	.00	243.31	4.93	248.77
(ROW%)	(0)	(0)	(0)	(0)	(0)	(98)	(2)	(100)

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TABLE II-9

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY CONGRESSIONAL CATEGORY

1984 ($MILLIONS)

CONGRESSIONAL CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL
ET	.00	.00	.00	.00	1.70	32.54	1.61	35.86
(ROW%)	(0)	(0)	(0)	(0)	(5)	(91)	(5)	(100)
HF	.00	.19	.00	40.21	.00	.70	8.80	49.90
(ROW%)	(0)	(0)	(0)	(81)	(0)	(1)	(18)	(100)
MP	3.79	28.02	1.88	.00	.55	.00	4.00	38.24
(ROW%)	(10)	(73)	(5)	(0)	(1)	(0)	(10)	(100)
ST	.00	.00	.87	.35	.00	143.00	4.84	149.06
(ROW%)	(0)	(0)	(1)	(0)	(0)	(96)	(3)	(100)
TOTAL	3.79	28.21	2.75	40.56	2.25	176.24	19.26	273.06
(ROW%)	(1)	(10)	(1)	(15)	(1)	(65)	(7)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY CONGRESSIONAL CATEGORY

1985 ($MILLIONS)

CONGRESSIONAL CATEGORY		DOD GOAL						
	1	2	3	4	5	6	VAR	TOTAL
ET	.00	.00	.00	.00	10.53	46.28	1.64	58.46
(ROW%)	(0)	(0)	(0)	(0)	(18)	(79)	(3)	(100)
HF	.00	.00	.00	55.37	.98	.70	9.50	66.55
(ROW%)	(0)	(0)	(0)	(83)	(1)	(1)	(14)	(100)
MP	3.54	40.04	1.28	.00	.77	.00	4.04	49.68
(ROW%)	(7)	(81)	(3)	(0)	(2)	(0)	(8)	(100)
ST	.00	.00	.04	.50	.00	243.31	4.93	248.77
(ROW%)	(0)	(0)	(0)	(0)	(0)	(98)	(2)	(100)
TOTAL	3.54	40.04	1.32	55.87	12.29	290.29	20.11	423.46
(ROW%)	(1)	(9)	(0)	(13)	(3)	(69)	(5)	(100)

TABLE II-10

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION	DOD GOAL 1	2	3	4	5	6	VAR	TOTAL
MI&L	1.45	3.39	.83	.00	.55	.49	.00	6.72
(ROW%)	(22)	(50)	(12)	(0)	(8)	(7)	(0)	(100)
ARMY	.00	13.53	.00	19.14	.00	66.52	.00	99.19
(ROW%)	(0)	(14)	(0)	(19)	(0)	(67)	(0)	(100)
NAVY	1.70	8.42	.88	7.61	1.70	60.71	.00	81.02
(ROW%)	(2)	(10)	(1)	(9)	(2)	(75)	(0)	(100)
AF	.63	2.87	1.04	13.81	.00	48.52	19.26	86.12
(ROW%)	(1)	(3)	(1)	(16)	(0)	(56)	(22)	(100)
TOTAL	3.79	28.21	2.75	40.56	2.25	176.24	19.26	273.06
(ROW%)	(1)	(10)	(1)	(15)	(1)	(65)	(7)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET

DOD GOAL BY DOD ORGANIZATION

1985 ($MILLIONS)

DOD ORGANIZATION	DOD GOAL 1	2	3	4	5	6	VAR	TOTAL
MI&L	.70	1.72	.30	.00	.77	.40	.00	3.90
(ROW%)	(18)	(44)	(8)	(0)	(20)	(10)	(0)	(100)
ARMY	.00	21.59	.00	28.46	.00	101.27	.00	151.32
(ROW%)	(0)	(14)	(0)	(19)	(0)	(67)	(0)	(100)
NAVY	1.69	11.92	.89	9.15	10.53	68.40	.00	102.58
(ROW%)	(2)	(12)	(1)	(9)	(10)	(67)	(0)	(100)
AF	1.15	4.81	.13	18.26	.98	120.22	20.11	165.66
(ROW%)	(1)	(3)	(0)	(11)	(1)	(73)	(12)	(100)
TOTAL	3.54	40.04	1.32	55.87	12.28	290.29	20.11	423.46
(ROW%)	(1)	(9)	(0)	(13)	(3)	(69)	(5)	(100)

TABLE II-11

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR BUDGET CATEGORY = 6.1,6.2

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1984 ($MILLIONS)

CONGRESSIONAL CATEGORY

DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY	4.49	14.58	3.71	6.04	28.82
(ROW%)	(16)	(51)	(13)	(21)	(100)
NAVY	5.78	6.61	6.84	3.68	22.91
(ROW%)	(25)	(29)	(30)	(16)	(100)
AF	7.16	20.09	7.00	15.30	49.55
(ROW%)	(14)	(41)	(14)	(31)	(100)
TOTAL	17.43	41.28	17.55	25.03	101.28
(ROW%)	(17)	(41)	(17)	(25)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR BUDGET CATEGORY = 6.1,6.2

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1985 ($MILLIONS)

CONGRESSIONAL CATEGORY

DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY	5.85	17.59	4.56	7.89	35.89
(ROW%)	(16)	(49)	(13)	(22)	(100)
NAVY	8.10	7.28	7.73	3.84	26.95
(ROW%)	(30)	(27)	(29)	(14)	(100)
AF	7.41	21.60	8.76	15.81	53.57
(ROW%)	(14)	(40)	(16)	(30)	(100)
TOTAL	21.36	46.47	21.05	27.54	116.42
(ROW%)	(18)	(40)	(18)	(24)	(100)

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TABLE II-12

MPT PROGRAM FUNDING IN 1984
BASED ON FY85 PRESIDENT'S BUDGET
FOR BUDGET CATEGORY = 6.1,6.2,6.3

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1984 ($MILLIONS)

DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY	12.06	18.79	13.53	23.54	67.92
(ROW%)	(18)	(28)	(20)	(35)	(100)
NAVY	10.01	7.80	10.35	10.35	38.51
(ROW%)	(26)	(20)	(27)	(27)	(100)
AF	7.29	23.31	7.67	24.61	62.88
(ROW%)	(12)	(37)	(12)	(39)	(100)
TOTAL	29.36	49.90	31.55	58.50	169.31
(ROW%)	(17)	(29)	(19)	(35)	(100)

MPT PROGRAM FUNDING IN 1985
BASED ON FY85 PRESIDENT'S BUDGET
FOR BUDGET CATEGORY = 6.1,6.2,6.3

CONGRESSIONAL CATEGORY BY DOD ORGANIZATION

1985 ($MILLIONS)
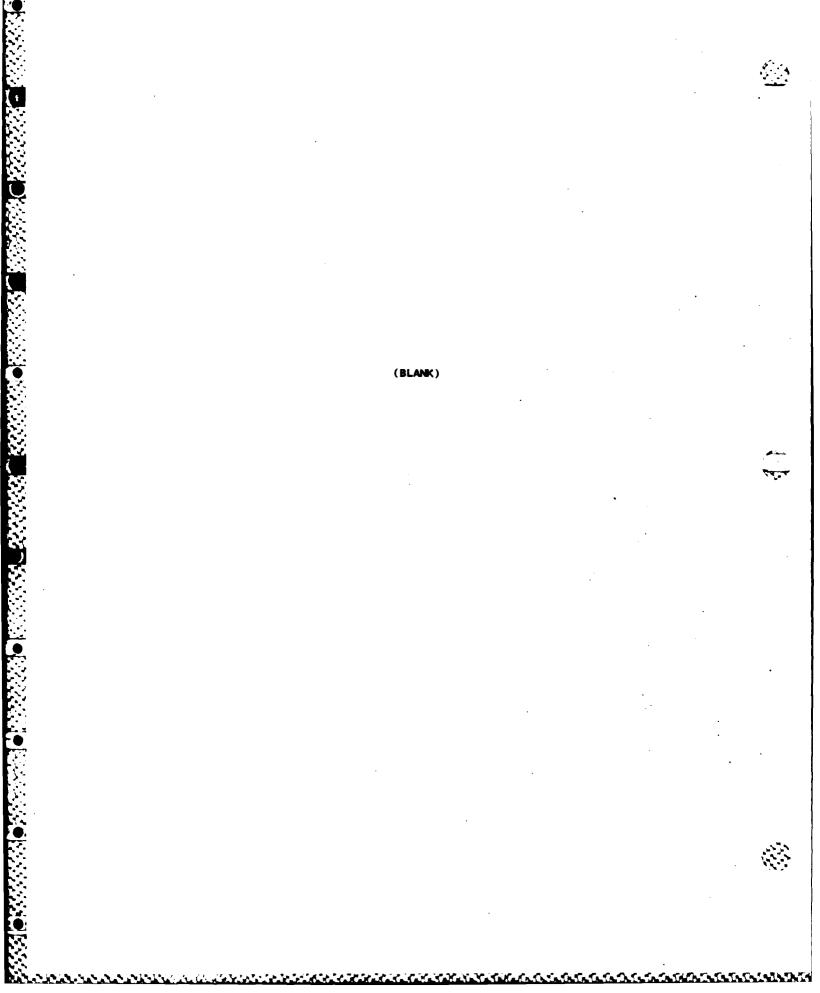
DOD ORGANIZATION	ET	HF	MP	ST	TOTAL
MI&L	.00	.00	.00	.00	.00
(ROW%)	(0)	(0)	(0)	(0)	(100)
ARMY	17.51	27.96	21.59	27.85	94.91
(ROW%)	(18)	(29)	(23)	(29)	(100)
NAVY	24.68	9.15	14.50	11.96	60.29
(ROW%)	(41)	(15)	(24)	(20)	(100)
AF	8.12	29.44	10.09	24.11	71.76
(ROW%)	(11)	(41)	(14)	(34)	(100)
TOTAL	50.32	66.55	46.17	63.92	226.96
(ROW%)	(22)	(29)	(20)	(28)	(100)

II-12-1

III. PROGRAM ELEMENT AND PROJECT SYNOPSES

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MANPOWER, PERSONNEL AND TRAINING
Program Funding by Service - JAN 1984

PE	TITLE	($ MILLIONS)			
		FY82	FY83	FY84	FY85

ARMY

PE	TITLE	FY82	FY83	FY84	FY85
61102A	DEFENSE RESEARCH SCIENCES	4.1	4.9	5.2	7.2
62716A	HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT	8.6	9.5	9.8	11.5
62717A	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION	3.4	3.6	3.9	4.8
62722A	MANPOWER, PERSONNEL AND TRAINING	6.5	6.1	6.6	7.9
62727A	NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY	2.5	2.5	3.4	4.5
63216A	SYNTHETIC FLIGHT SIMULATORS	6.0	7.5	12.1	9.1
63731A	MANPOWER AND PERSONNEL	4.2	7.1	9.8	17.0
63738A	NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT	0.8	0.9	2.4	6.1
63739A	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS	3.2	4.4	4.2	10.4
63743A	EDUCATION AND TRAINING	8.8	9.9	7.6	11.7
63744A	TRAINING SIMULATION	2.4	2.6	3.0	4.8
64217A	SYNTHETIC FLIGHT TRAINING SYSTEMS	5.3	26.9	12.7	14.1
64715A	NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING	13.2	7.7	12.6	34.5
64722A	EDUCATION AND TRAINING SYSTEMS	0.0	0.0	6.0	7.7
	SUBTOTAL - ARMY:	**68.6**	**93.4**	**99.1**	**151.3**

NAVY

PE	TITLE	FY82	FY83	FY84	FY85
61153N	DEFENSE RESEARCH SCIENCES	9.1	10.4	9.9	12.5
62757N	HUMAN FACTORS AND SIMULATION TECHNOLOGY	6.4	8.9	7.3	8.0
62763N	PERSONNEL AND TRAINING TECHNOLOGY	8.1	6.8	5.7	6.5
63701N	HUMAN FACTORS ENGINEERING	2.9	2.4	1.2	1.9
63707N	MANPOWER CONTROL SYSTEMS DEVELOPMENT	4.4	2.4	1.8	5.1
63710N	MAN-MACHINE TECHNOLOGY	0.0	0.0	0.0	0.0
63720N	EDUCATION AND TRAINING	3.7	2.7	2.2	5.1
63727N	ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION	1.3	1.3	1.7	10.5
63732M	MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS	1.8	2.0	2.1	3.0
63733N	TRAINING DEVICES TECHNOLOGY	7.0	6.1	6.6	7.8
63739N	PERSONNEL PRODUCTIVITY	0.0	0.0	0.0	0.0
64703N	TRAINING AND PERSONNEL SYSTEM DEVELOPMENT	10.4	7.0	3.3	6.5
64709N	JOINT SERVICE MANPOWER/PERSONNEL PROTOTYPES	4.9	0.0	0.0	0.0
64714N	AIR WARFARE TRAINING DEVICES	27.9	17.0	11.6	3.1
64715N	SURFACE WARFARE TRAINING DEVICES	40.7	31.6	27.1	32.2
64716N	SUBMARINE WARFARE TRAINING DEVICES	0.0	0.0	0.6	0.5
	SUBTOTAL - NAVY:	**128.4**	**98.3**	**81.0**	**102.5**

AIR FORCE

PE	TITLE	FY82	FY83	FY84	FY85
61102F	DEFENSE RESEARCH SCIENCES	4.9	4.8	5.5	5.7
62202F	AEROSPACE BIOTECHNOLOGY	9.7	9.0	14.6	15.9
62205F	TRAINING AND SIMULATION TECHNOLOGY	14.2	17.2	22.5	23.3
62703F	PERSONNEL UTILIZATION TECHNOLOGY	5.5	6.7	7.0	8.8
63106F	LOGISTICS R&D REQUIREMENTS	0.0	0.0	0.0	0.0
63227F	ADVANCED SIMULATOR TECHNOLOGY	4.2	14.7	6.7	6.4
63231F	CREW SYSTEMS TECHNOLOGY	0.0	0.0	1.3	4.0
63365F	SPACE BIOTECHNOLOGY	0.0	0.0	0.0	0.7
63704F	MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY	0.0	0.0	0.8	2.1
63751F	INNOVATIONS IN EDUCATION AND TRAINING	2.5	2.6	4.5	5.1
64227F	FLIGHT SIMULATOR DEVELOPMENT	11.1	8.5	23.3	93.9
	SUBTOTAL - AIR FORCE:	**52.0**	**63.4**	**86.1**	**165.6**
	TOTAL:	**249.2**	**255.3**	**286.3**	**419.5**

III-1

TRAINING AND PERSONNEL TECHNOLOGY
RESEARCH ORGANIZATIONS

ARMY

AVRADCOM	Army Aviation Research and Development Center
ARI	Army Research Institute
HEL	Army Human Engineering Laboratory
PMTRADE	Project Manager for Training Devices

NAVY

HQMC	Headquarters, US Marine Corps
NADC	Naval Air Development Center
NAMRL	Naval Aerospace Medical Research Laboratory
NAVAIR	Naval Air Systems Command
NAVELEX	Naval Electronic Systems Command
NAVSEA	Naval Sea Systems Command
NOSC	Naval Ocean Systems Center
NPRDC	Navy Personnel Research and Development Center
NSRDC	Naval Ship Research and Development Center
NSWC	Naval Surface Weapons Center
NTEC	Naval Training Equipment Center
ONR	Office of Naval Research

AIR FORCE
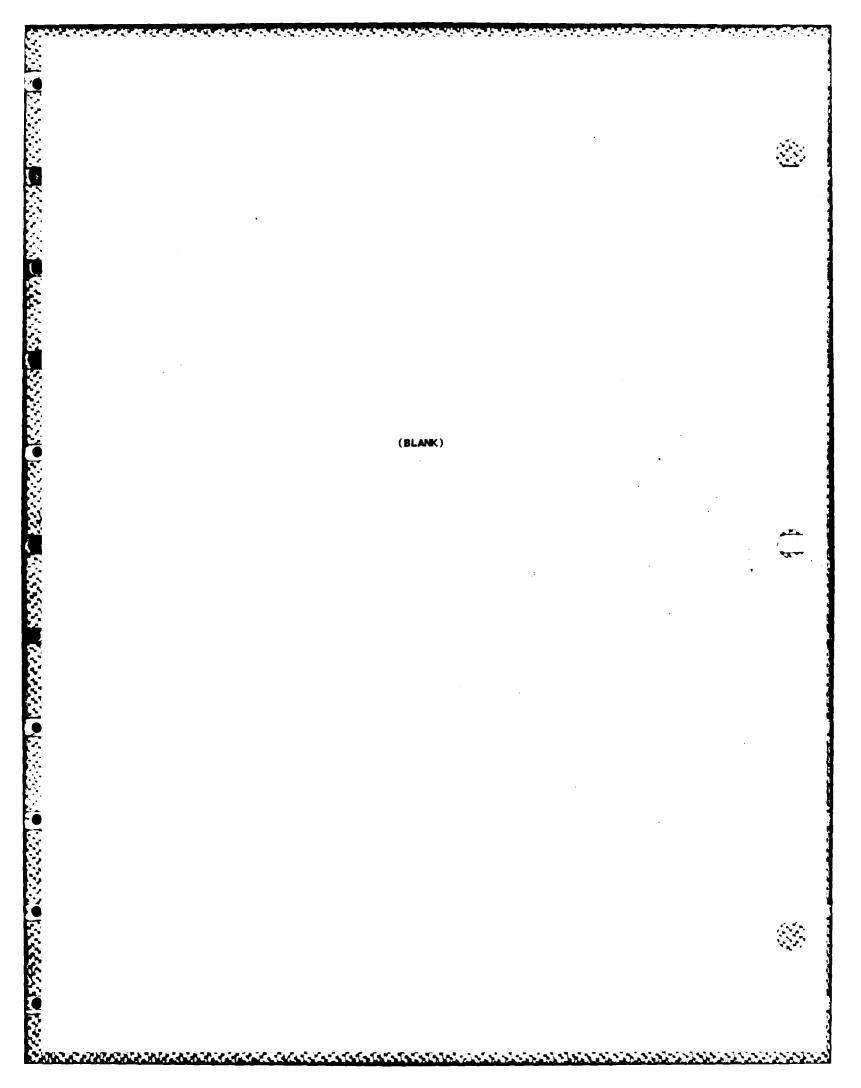
AFAMRL	Air Force Aerospace Medical Research Laboratory
AFHRL	Air Force Human Resources Laboratory
AFOSR	Air Force Office of Scientific Research
AMD	Aerospace Medical Division
SIMSPO	Simulation Systems Project Office

III.A. ARMY PROGRAM ELEMENT AND PROJECT SYNOPSES

Table III-A-1: Listing of Projects - Lists projects for each ARMY
program element. Lists contain performing organization, funding,
Congressional Category and goal information.

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PROGRAM ELEMENT OVERVIEW

PE: 61102A   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                              HUMAN FACTORS
                              MANPOWER & PERSONNEL
                              SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 5.2M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 7.2M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:
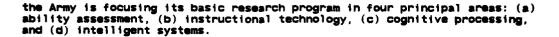
The objectives of this Program Element are to: (a) develop the behavioral
science base on which to build new technologies to improve future
effectiveness of soldiers and systems, (b) capitalize on relevant new
research developments that have potential for resolution of future
operational Army problems, (c) involve innovative scientists in research
relevant to the solution of future operational Army problems, and (d) lead
the next generation of applied research.

Basic research is needed to attack problems in personnel performance and
training arising as a result of changing needs and policies. Predictions,
such as those in the Air Land Battle 2000, envision the future military
environment with fewer people and people of more diverse quality, and foresee
that the Army will face increasing training time, training costs, equipment
sophistication, information overload, and dependence on computer-driven
systems. Basic research helps to advance the technology base supporting the
five major domains: Structure and Equip the Force, Man the Force, Train the
Force, Develop Units, and Maintain Force Readiness.

This Program Element supports basic research in four broad areas: (a)
Manpower and Personnel, which includes recruitment, selection, assignment,
motivation, retention, leadership, and institutionalized personnel management,
(b) Education and Training, which involves individual skills, methods for
assessing skill training requirements and instructional systems, and methods
for evaluating such instructional technology, (c) Simulation and Training
Devices, which ensures that emerging high technology enhances total system
effectiveness by developing and evaluating instructional systems using
performance measurement criteria and by evaluating variables such as transfer
of training and system fidelity, and (d) Human Factors, which is concerned
with optimizing human performance in the complex soldier-machine systems now
being acquired by the Army.

Future requirements for the Army set the stage for the research trends of
today. For example, more accurate and faster methods for assessing abilities
and skills will be needed, and the Army will have to increase the
individual's ability to learn and operate at more abstract conceptual levels.
Soldiers will have to be trained in multiple skills through faster, less
costly and more generic training. All of this must occur with a lower ratio
of trainers to trainees. Increased reliance on simulation appears imperative,
and command and control networks will be needed for information sharing in
planning and decision making.

The next generation of applied research will emphasize information
handling/engineering using portable, high speed computers. To develop this
technology, knowledge is needed on how people process information, and the
necessary conditions for information processing. To meet these challenges,

III-A-1

the Army is focusing its basic research program in four principal areas: (a) ability assessment, (b) instructional technology, (c) cognitive processing, and (d) intelligent systems.

PAYOFF/UTILIZATION:

The payoff of this Program Element will be a behavioral science base on which to build new technologies to improve the effectiveness of soldiers and systems.

Work will be performed to investigate: (a) more accurate, faster methods for assessing abilities and skills, (b) methods to increase the individual's ability to learn, (c) how to increase individual's ability to operate at more abstract conceptual levels, (d) training in multiple skills, (e) faster, less costly generic training, (f) lower ratio of trainers to trainees, (g) reliance of simulation in training, (h) "expert" problem solving, (i) machine processing of information, (j) distributed information processing and decision making, (k) group decision making, and (l) command and control networks.

FUTURE DIRECTIONS:

New directions for this Program Element include plans to: (a) move further out on the basic-applied research continuum, (b) perform interactive research with selected university "Centers of Excellence", (c) develop non-production-line measures of productivity, and (d) investigate human creativity. Other possible future thrusts include investigation of: (a) psychomotor skill measurement and training, (b) voice synthesis/recognition, (c) over-training to mitigate stress interference, (d) implications of 5th generation computers, and (e) an interface with molecular biology/physiology.

PROJECT OVERVIEW

		84	85
PROJECT: B74A	HUMAN ENGINEERING	$ 2.5M	$ 2.6M
PE: 61102A	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY HUMAN ENGINEERING LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to support human factors engineering by deriving soldier performance data which can be used to develop better engineering design principles.

New information is needed on the capabilities and limitations of men and women so predictions may be made about the performance of soldiers when using military equipment under all field conditions in all environments. Detailed findings are then used in the design of displays, controls, workspaces, and complex equipment such as command and control facilities. This effort will support fundamental research to stimulate scientific progress and novel human engineering concepts to provide options for future Army technology and to ensure against surprises in the operational capability of potential adversaries. The assessment of scientific results with respect to Army applications, exploitation of novel concepts, and efficient transfer into exploratory development programs should maintain or increase the U.S. lead in critical areas of military technology.

Through laboratory and field experiments, scientific data will be obtained on the (male or female) soldier's senses: i.e., audition, vision, central nervous system functioning, and physical performance under adverse combat-like conditions. Research will be conducted in three areas: (a) Sensory Processing research will advance fundamental knowledge of the human sensory system, including audition and vision and their interactions (this information will be collated and distributed to the military and scientific communities through the open literature, symposia, and interaction with members of the professions involved), (b) Soldier Performance research will assess soldier behavior and factors affecting motor performance, stress and its effect on risk taking, learning and memory processes, and the relative capabilities of males and females in tactical situations, and (c) Information Processing research will examine abilities such as behavioral and oculometric factors fundamental to viewing to increase understanding of higher mental processes.

In FY 84 research will be conducted on: (a) the internal representation of events in memory, (b) the optimization of cognitive functioning, (c) a new information sampling technique to examine judgment performance in various situations, (d) endocrine mechanisms underlying male and female performance differences, (e) eye movement processes during reading, pictorial representation, and visual search, (f) reading/comprehension and picture processing, (g) the use of behavioral, instructional and oculomotor recordings to study literacy, (h) selective attention and the theta response of the central nervous system, (i) devising design principles for display of auditory and visual information in complex operator-machine systems, (j) the role of selective attention in controlled and automatic target detection tasks, (k) personality correlates for stress susceptibility, and (l) brain-behavior relationships in regard to attention to complex displays and

behavior under stress.

In FY 85 it is planned to: (a) integrate previous research on choice, learning, and perceived control to improve training methods, (b) continue work on logical inferences and misinterpretations of information as it pertains to command and control (C2) and command, control, and communications (C3), (c) encourage text makers to make linguistic and format changes to texts to enhance general literacy rates, (d) begin integrating human and animal data on stress effects, (e) assess results of auditory and visual masking (noise) on higher mental processes, and (f) begin work to describe and characterize changes in brain activity with alterations in behavioral (attention, vigilance) and central nervous system arousal states.

PAYOFF/UTILIZATION:

The payoff of this Project is the enhancement of the soldier-machine interface, thereby increasing the capability of the soldier to operate and maintain Army materiel. A second goal is to reduce the manpower required to accomplish Army missions. The value of this Project is reflected in numerous publications and presentations adding to the knowledge base in these areas and the transition of findings to Army-relevant interests in soldier reading abilities, information transfer, soldier gender differences, and equipment design.

By fully understanding the U.S. soldier's capabilities and limitations, both physical and mental, designers will be able to develop equipment that achieves the optimum man-machine interface and increases battlefield effectiveness. This would greatly improve operational readiness, combat effectiveness and sustainability in all mission crews.

PROJECT OVERVIEW

		84	85
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PROJECT: B74F	PERSONNEL PERFORMANCE AND TRAINING	$ 2.7	$ 4.6M
PE: 61102A	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objective of this basic research Project is to fill gaps in the
scientific methodology and data by producing the concepts, techniques and
data needed to support applied research on the Army's problems.

Basic research is needed to attack problems in personnel performance and
training arising as a result of changing needs and policies. Predictions,
such as those in the Air Land Battle 2000, envision the future military
environment with fewer people and people of more diverse quality, and predict
that the Army will face increasing training time, training costs, equipment
sophistication, information overload, and dependence on computer-driven
systems. Basic research helps to advance the technology base supporting the
five major domains: Structure and Equip the Force, Man the Force, Train the
Force, Develop Units, and Maintain Force Readiness.

This Project supports basic research in four broad areas: (a) Manpower and
Personnel, which includes recruitment, selection, assignment, motivation,
retention, leadership, and institutionalized personnel management, (b)
Education and Training, which involves individual skills, methods for
assessing skill training requirements and instructional systems, and methods
for evaluating such instructional technology, (c) Simulation and Training
Devices, which ensures that emerging high technology enhances total system
effectiveness by developing and evaluating instructional systems, including
computer-based instruction, by developing performance measurement criteria,
and by evaluating variables such as transfer of training and system fidelity,
and (d) Human Factors, which is concerned with optimizing human performance
in the complex soldier-machine systems now being acquired by the Army.

The Army's current basic research program is focused in four principal areas:
(a) Ability Assessment, (b) Instructional Technology, (c) Cognitive
Processing, and (d) Intelligent Systems.

(a) Ability Assessment deals with the problem of assessing and measuring the
innate abilities and acquired skills and knowledge of individuals. New
methods are sought for measuring intelligence, for developing test procedures
to provide more detailed profiles of individual abilities, for defining the
varying levels of conceptual abstraction of individuals, for determining if
and how individuals can be trained to go from one level of abstract
conceptual functioning to a higher one, and for exploring the concept that
learning time can serve as a measure of potential. This area is also
concerned with measuring individual levels of attainment after skill
training. This includes research on computer adaptive testing and testing
nonverbal skills, such as spatial and manual skills.

(b) Instructional Technology includes three major thrusts. The first,
instructional strategies, researches individual learning strategies, analytic

reasoning strategies, and methods used by experts and novices to approach problems. Computer-based instruction (CBI) procedures are being developed for training psychomotor skills and for determining optimal schedules for such training. This and related work is laying the groundwork to convert CBI into individually tailored, interactive instructional systems, the precursor to intelligent computer adaptive instruction (ICAI) systems. The third thrust, expanding learning skills, is trying to overcome a common earlier assumption that there are "natural limitations" inherent in humans' ability to learn. Also, further work will be done on split brain learning to explore the phenomenon of right brain versus left brain learning and to investigate its implications for Army instructional systems.

(c) Cognitive Processing Limitations efforts deal with the Army's growing reliance on increasingly rapid, sophisticated, computer-driven information processing systems. Man-machine integration focuses on developing guidelines for optimal allocation of tasks between the human user and the computer. A thrust on information overload responds to a growing need for a theoretical structure to determine how best to package information for different types of settings, situations, and tasks to alleviate information overload under various levels of operating load and time pressure. Decision making research focuses on areas such as how decision makers organize information, how incoming information is weighted for validity and importance, and how factors such as uncertainty affect decisions. Basic research is also needed on procedures for group decision making and for determining the need for shared data bases. Other work will try to identify and overcome types of bias, such as the systematic bias that experts are subject to, even if they are unaware of being biased.

(d) The Intelligent Systems area explores issues related to the machine processing of information, including applications and extensions of techniques initially developed in the artificial intelligence and cybernetics communities. Research is done to determine what kinds of representations are most appropriate for various knowledge domains and purposes. This is applicable to large scale systems which need to determine how to collate and organize information for future use and to determine appropriate categories and mechanisms for retrieving information at the needed time. Other areas to be investigated include methods of knowledge transfer, flexibility of knowledge representation, representation of dynamic information, and knowledge creation through inferential, deductive, and inductive procedures.

A primary focus of research on learning is the development of methods for initially creating new data bases from discrete information and for incorporating new information into an existing data base. Another area to be investigated is how humans learn by extrapolation or analogies and how these mechanisms could be incorporated into machine programs. Basic research on computerized aids for problem solving involve areas such as the procedures of iterative branching techniques used in heuristic problem solving, rule based and goal directed problem solving, the non-linear approach often used by experts, and the inductive approach whereby individuals reason backward from fragmentary evidence to determine an underlying scheme, purpose, or reason. Research is underway on structured planning, particularly the rules and procedures used to plan for ill-defined futures. Other work investigates how planners generate new goals, modify goals, and create alternate goals. Work is also being done to develop methods for incorporating the user's value judgments into machine system planning operations. Added areas of support include distributive planning, in which experts in different subject matter areas are geographically removed from one another, generic planning which develops systems capable of producing plans for different subsets of related areas or situations, and meta-planning, or planning for planning.

PAYOFF/UTILIZATION:

The payoff of this Project is increased basic knowledge and the development of research methods for the most affective determination of individual abilities, for rapid and efficient training in military units and systems, and for an optimal match between soldiers and equipment in large scale, equipment-intensive systems. The Army has a need for higher quality, better trained and motivated soldiers while there is increasing competition for the declining manpower pool available. Simultaneously, Army tactical operations are becoming increasingly complex. These trends are expected to continue through the 1980s and 1990s.

Basic research in this Project aims to develop the behavioral science base for future applied research to improve the effectiveness of Army systems and soldiers. This includes the development of data bases and the development of new techniques and methods in behavioral science areas. The program attempts to capitalize on and further develop new research approaches having potential for resolving future Army operational problems.

PROGRAM ELEMENT OVERVIEW

PE: 62716A   HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 9.8M (FY85 PRESIDENT'S BUDGET)
                              FY85 $11.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to support the Army's technology
thrust in Soldier-Machine Interface, and ensure that Army equipment can be
effectively operated and maintained by soldiers in the field.

The program generates human performance data for the Army System Acquisition
Review Council and for use throughout the Army materiel development process.
The Human Engineering Laboratory (HEL) is performing the in-house work in
this program. HEL is the lead agency for DARCOM (U.S. Army Materiel
Development and Readiness Command) in field robotics, and military operations
in urban terrain (MOUT) in the information clearinghouse area. Through the
work of HEL, this Program Element provides for direct HFE support to over 200
materiel systems/subsystems under development.

HEL is also a leader in tri-Service coordination through a tri-Service Human
Factors Technology Coordination Group. HEL participates in various committees,
assembles all appropriate data, and publishes all tri-Service HFE design
standards and HFE design handbooks. HEL also chairs two NATO R&D committees
and performs Independent Human Factors Engineering Analyses (HFEA) on all
major Army materiel systems which require biomedical, safety, operational,
and development testing inputs. These efforts help to eliminate duplication
of effort within the Army and the DoD.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved U.S. Army artillery
system effectiveness in combat, (b) increased ability to fight in built-up
areas, (c) personal equipment for the individual soldier which is compatible
with his weapons, protective mask, load-carrying equipment, cold weather
clothing system, and armored vest, (d) better performance of individual and
crew-served weapon systems, (e) improved development of displays for Army air
defense systems, (f) reduced aircrew workload imposed by the introduction of
new technologies, (g) improved controls and equipment in Army helicopters,
(h) improved ammunition resupply procedures, and (i) more effective soldier
integration into command, control, and communication (C3) nets.

This effort has provided direct HFE support to over 200 systems/subsystems,
including over 2500 HFE design recommendations. This will result in more
soldier-compatible and operationally effective equipment. Some of the
specific systems benefitting from this program include the robotic howitzer
loader system, the battlefield robotic ammunition supply system (BRASS), the
short-range air defense systems command and control (SHORADS C2) system, the
integrated intelligent vehicle (V(INT)2), fire control systems, and various
soldier clothing, gear, and protective systems.

FUTURE DIRECTIONS:

In FY 86, this Program Element will continue to address the following areas
of research: (a) automation/artificial intelligence/robotics, (b) combat
service support, (c) individual soldier support, (d) fire support, (e)
aviation/air defense, (f) combat fighting vehicle crew interface, (g) MOUT,
(h) individual weapons, and (i) C3 ' erface.

PROJECT OVERVIEW

	84	85
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PROJECT: AH70 HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT	$ 9.8M	$11.5M

PE: 62716A   HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: ARMY HUMAN ENGINEERING LABORATORY

PROJECT SYNOPSIS.

The objectives of this Project are to: (a) generate data on soldier-system interfaces, soldier-system performance, and the capabilities and limitations of soldiers, and (b) provide for the application of these data throughout the Army materiel development process.

Human engineering acquires human performance data and provides design guidance for all types of equipment that is worn, operated, or maintained by soldiers. Precise, specific information is also needed on the physical and psychological capabilities and limitations of soldiers so that Army materiel systems will be designed for maximum field effectiveness. This is increasingly important as weapon systems and materiel become more sophisticated.

In FY 84, HEL will complete: (a) the transition of the robotic howitzer loader hardware to the Belvoir Research and Development Center as part of the Battlefield Robotic Ammunition Supply System (BRASS) program, (b) a final report of the extended cold weather clothing system, (c) an evaluation of eye armor, and (d) the combat boot program evaluation reports. HEL will continue to: (a) establish a DARCOM (U.S. Army Materiel Development and Readiness Command) Robotics Integration Center to coordinate, integrate, and communicate robotic technology, as DARCOM's lead agency for field robotics, (b) use the HEL Battalion Artillery Test (HELBAT) Command and Control (C2) research facility to conduct bottom-up evaluations of fire support command, control, and communications (C3) hardware, doctrine, and procedures, (c) field test unit configured loads for mechanized infantry and armor units, (d) make progress on soldier-machine interface logistics R&D efforts in bar coding in a tactical environment, in lightweight materials for tactical ammunition packs and magazines, and in computer and communication requirements for combat services support command and control, (e) serve as DARCOM's lead laboratory for military operations in urban terrain (MOUT) in the information clearinghouse area by providing bulletins on significant MOUT events, and (f) provide direct HFE support to over 200 materiel systems/subsystems under development. HEL will begin to: (a) use full-scale mockups to test innovative command post C3 concepts (such as large screen displays, "smart" radios) in both normal and nuclear/biological/chemical (NBC) environments, (b) interface tactical container-resupply vehicles, (c) design, develop, and initiate soldier performance evaluations on short-range air defense system command and control (SHORADS C2) fire unit and battalion level display and control concepts, (d) evaluate applications of voice interactive systems in Army helicopters, and (e) conduct fire control research vehicle live fire evaluation with the Army Materiel Systems Analysis Activity, the Tank-Automotive Command, the Ballistics Research Laboratory, and the Armament, Munitions and Chemical Command.

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In FY 85, HEL will: (a) focus on development of a prototype militarized manipulator within the context of logistics R&D as part of HEL/DARPA (Defense Advanced Research Projects Agency) Militarized Robotic Component Research, (b) inaugurate a feasibility technology to the structuring of an ammunition supply point, (c) initiate an evaluation program to establish performance parameters for load-bearing equipment in the integrated individual fighting systems program, (d) use the C2 facility to further quantify the type and format of data required at each node of the fire support system to optimize effectiveness, (e) develop and exploit technology in the areas of packaging, handling, and transportation, computers and robotics as they relate to manpower reduction and increased productivity and capability goals for theatre logistics, (f) design, develop, and initiate SHORADS C2 soldier performance evaluations, (g) develop aircrew performance design criteria for the use of multi-axis flight controls in Army helicopters, (h) complete and distribute the MOUT digest, (i) complete further evaluations of C2 message relationships between net echelons, data on other than command nets, and further analysis of man-made signal interference factors, (j) provide HFE support to battlefield laser programs for the DARCOM Counter Measure/Counter Counter Measure Center, the U.S. Army Training and Doctrine Command (TRADOC)/Combined Arms Center, and the U.S. Army Missile Command-Directed Energy Directorate, and (k) provide direct HFE support to over 200 systems/subsystems under development.

PAYOFF/UTILIZATION:

The payoff of this Project includes assurance that Army materiel and concepts of its use conform with the capabilities and limitations of the fully equipped soldier.

Specific accomplishments in FY 83 are as follows: (a) system components and software were delivered and integrated into a test bed robotic howitzer loader system, (b) design of a mechanical robot gripper mechanism for acquiring 8-inch artillery projectiles was completed, (c) the first field laboratory evaluation comparing present and prototype cold/wet clothing systems was developed and implemented in conjunction with TRADOC and other agencies, (d) a program to evaluate various candidate Army boots in a field environment was planned and implemented, (e) three field evaluations were conducted on chemical protective overgarments and overboots made from new high-technology materials, which were found to provide equal protection while being lighter and more durable, (f) TRADOC Headquarters approval of concept statements for Unit Configured Load and BRASS was obtained, (g) the "Human Engineering Guidelines for Management Information Systems" was published, (h) experiments on missile component repair while wearing NBC protective clothing were completed, (h) baseline data on human performance parameters of the manual SHORADS C2 System was developed, (i) a standardized air defense radar symbology specification was produced, (j) an analysis of the impact of chemical/biological protective systems on aircrew performance was completed, (k) evaluation programs for a fire control research system were developed in collaboration with other facilities, (l) information requirements for C2 for armor efforts were conducted with Germany in support of the integrated intelligent vehicle (V(INT)2) program, and (m) a review of 22 MOUT battles from 1942 through 1982 was completed.

PROGRAM ELEMENT OVERVIEW

PE: 62717A   HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION

CONGRESSIONAL CATEGORY: HUMAN FACTORS
                                    SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 3.9M (FY85 PRESIDENT'S BUDGET)
                                    FY85 $ 4.8M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to increase the effectiveness of
human performance in new, more effective and user-sophisticated weapons and
supporting command and control (C2) systems.

This technology base, exploratory development program is required if the Army
is to have a data and knowledge base for subsequent advanced development work
on the impact of humans on system effectiveness. Specific requirements fall
into four areas: (a) continue development of reliable and refined procedures
for measuring the contribution of the operator to system effectiveness, (b)
develop human performance data specifically for command, control,
communication and intelligence (C3I) systems, (c) provide the designers of
simulators and other training devices with cost/human effectiveness trade-off
data that will minimize the use of costly operational equipment, and (d)
precisely determine average levels and ranges of variation in human
performance in combat units for a variety of land combat conditions for use
in battlefield computer simulations.

Results of human factors research from this program move to advanced
development under Program Element 63739A (Human Factors in Training and
Operational Effectiveness). Results of simulator and training device research
from this program move to advanced development under Program Element 63744A
(Training Simulation). Duplication of effort is avoided within the Army
through annual Technology Base Reviews, and within the DoD through annual
Technical and Apportionment Reviews, and participation in additional reviews
and advisory groups. This research is coordinated directly with other Service
R&D organizations, including the Air Force Human Resources Laboratory (AFHRL),
the Navy Personnel Research and Development Center (NPRDC), the Army Project
Manager for Training Devices (PMTRADE), the Army Human Engineering Lab (HEL),
and the Naval Training Equipment Center (NTEC).

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved human performance
effectiveness in new, more user-sophisticated weapons and supporting command
and control systems, and (b) a data and knowledge base on the impact of
humans on system effectiveness.

These developments are required to achieve effective operational capabilities
in the face of decreasing quality and quantity of available personnel, and
the increasing complexity and costs of maintaining and operating weapon
systems. Completed products that will lead to a technology base for improved
human performance include: (a) procedures for expressing tactical manpower,
personnel, and training requirements for use in weapon systems acquisition,
(b) procedures for information control and intelligence analysis in
battlefield systems, (c) a method for determining performance gains and
losses associated with automating command and control systems functions, (d)

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a prototype aircrew training manual, (e) performance requirements for an aviation training research simulator, (f) specifications for a tactical performance simulation research facility, and (g) an assessment of factors determining how similar to operational equipment simulators and training devices must be to maximize training effectiveness and minimize equipment cost.

FUTURE DIRECTIONS:

Beyond FY 85, plans include: (a) development of analytic and computer models to compare the impact of various design concepts for crew-served weapons on the range of skills and aptitudes of potential crew members, (b) development of design criteria for lower-cost simulators, and (c) determination of soldier mental performance requirements in emerging high-technology weapon systems.

PROJECT OVERVIEW

		84	85
PROJECT: A790-1	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION	$ 1.6M	$ 1.9M

PE: 62717A   HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: ARMY RESEARCH INSTITUTE

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop more and more refined measures of the contribution of humans to system effectiveness, for eventual input to trade-off decisions as part of the weapon system research, development, and acquisition process, (b) develop and refine the data and knowledge bases on human performance in command, control, communication, and intelligence (C3I) so that eventual design of these systems capitalizes on the human component, (c) enhance the knowledge base in the area of human learning, for eventual impact on the design of less complex, lower cost training equipment, and (d) determine human performance parameters relevant to the design of improved combat simulation computer models and evaluate the impact of including human performance parameters on the models' ability to predict battle outcomes.

The battlefield of the future will employ more sophisticated weapons. These weapon systems and supporting automated C3I systems will demand the performance of more and more complex tasks by human operators and maintenance personnel. Dynamics of the battlefield require that these weapon systems be effectively employed in concert with other weapon systems in combined arms operations, and it is critical to have an understanding of how this can be accomplished to obtain maximum benefits from the special capabilities of each. Computer-based land combat simulation models are used for this purpose, and the capabilities and limitations of the human under various conditions must be determined for input into these models.

In FYs 84 and 85 it is planned to: (a) develop methods to translate weapons design concepts into soldier skill requirements, (b) design prototype job aids for lower aptitude personnel, (c) develop analytic models to understand human performance in extended operations, and (d) evaluate procedures for application of microprocessors to improve simulators and training devices.

This Project supports the Congressional Category of Human Factors.

PAYOFF/UTILIZATION:

The payoff of this Project includes increased effectiveness of human performance in new, more sophisticated weapon systems and supporting C3I systems.

In FY 83, accomplishments included: (a) new, standardized procedures for expressing tactical manpower, personnel, and training requirements for use in weapon systems acquisition, (b) validated procedures for information control and intelligence analysis in battlefield systems, (c) a method for determining performance gains and losses associated with automating a variety

of functions in command and control systems, (d) a validated prototype aircrew training manual, (e) performance requirements for an aviation training research simulator, (f) specifications for a tactical performance simulation research facility, and (g) assessment of the factors which determine how similar to operational equipment simulators and training devices must be to maximize training effectiveness and minimize equipment cost.

PROJECT OVERVIEW

		84	85
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PROJECT: A790-2	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION	$ 2.3M	$ 2.9M

PE: 62717A   HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: ARMY RESEARCH INSTITUTE

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop more and more refined measures of the contribution of humans to system effectiveness, for eventual input to trade-off decisions as part of the weapon system research, development, and acquisition process, (b) develop and refine the data and knowledge bases on human performance in command, control, communication, and intelligence (C3I) so that eventual design of these systems capitalizes on the human component, (c) enhance the knowledge base in the area of human learning, for eventual impact on the design of less complex, lower cost, training equipment, and (d) determine human performance parameters relevant to the design of improved combat simulation computer models and evaluate the impact of including human performance parameters on the models' ability to predict battle outcomes.

The battlefield of the future will employ more sophisticated weapons. These weapon systems and supporting automated C3I systems will demand the performance of more and more complex tasks by human operators and maintenance personnel. Dynamics of the battlefield require that these weapon systems be effectively employed in concert with other weapon systems in combined arms operations, and it is critical to have an understanding of how this can be accomplished to obtain maximum benefits from the special capabilities of each. Computer-based land combat simulation models are used for this purpose, and the capabilities and limitations of the human under various conditions must be determined for input into these models.

In FYs 84 and 85 it is planned to: (a) develop methods to translate weapons design concepts into soldier skill requirements, (b) design prototype job aids for lower aptitude personnel, (c) develop analytic models to understand human performance in extended operations, and (d) evaluate procedures for application of microprocessors to improve simulators and training devices.

This Project supports the Congressional Category of Simulation and Training Devices.

PAYOFF/UTILIZATION:

The payoff of this Project includes increased effectiveness of human performance in new, more sophisticated weapon systems and supporting C3I systems.

In FY 83, accomplishments included: (a) new, standardized procedures for expressing tactical manpower, personnel, and training requirements for use in weapon systems acquisition, (b) validated procedures for information control and intelligence analysis in battlefield systems, (c) a method for

determining performance gains and losses associated with automating a variety of functions in command and control systems, (d) a validated prototype aircrew training manual, (e) performance requirements for an aviation training research simulator, (f) specifications for a tactical performance simulation research facility, and (g) assessment of the factors which determine how similar to operational equipment simulators and training devices must be to maximize training effectiveness and minimize equipment cost.

PROGRAM ELEMENT OVERVIEW

PE: 62722A   MANPOWER, PERSONNEL AND TRAINING

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                              MANPOWER & PERSONNEL

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 6.6M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 7.9M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide highly effective manpower
and personnel technology for improving the Army's acquisition and management
of its personnel resources.
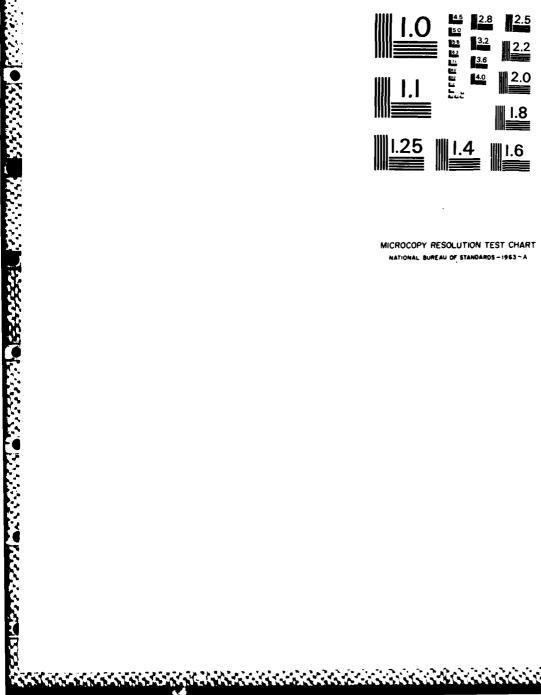
Faced with a declining youth pool to draw from, commitments worldwide, and
user-sophisticated weaponry, leverage is obtained through new advances in
understanding and measuring human performance, and engineering advances such
as micro-electronics and computer technology. This leverage must be produced
to improve the Army's ability to attract, select, train, and utilize soldiers
cost-effectively. Improved methods are needed to: (a) integrate the mental
and physical capabilities of personnel into the design of new weapon and
materiel systems, (b) promote soldier commitment to the Army and enhance unit
cohesion while sustaining high performance, (c) evaluate new techniques for
leadership training, and (d) provide an empirical basis for the design and
development of appropriate instructional technology and new training programs
for individual soldier skill development.

Results of manpower and personnel research from this exploratory program move
to advanced development under Program Element 63731A (Manpower and
Personnel). Results of education and training research from this program move
to advanced development under Program Element 63743A (Education and
Training). Duplication of effort is avoided within the Army through annual
Technology Base Reviews, and within the DoD through topical reviews,
tri-Service participation in Technical Advisory Groups, and preparation of
Technology Coordinating papers on such topics as selection and assignment
techniques, leadership development, and technical training. This research is
coordinated directly with other Service R&D organizations, including the Air
Force Human Resources Laboratory (AFHRL) and the Navy Personnel Research and
Development Center (NPRDC).

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) a potential savings of more
than $200 million a year as a result of improved soldier retention and
reduced training time, (b) better methods for recruiting, selecting, training,
assigning, and utilizing personnel, (c) better assessment of mental
aptitudes and skills so that the mental and physical capabilities of
personnel can be effectively integrated into the design of weapon and
materiel systems, (d) improved, cost-effective instructional methods for
individual soldier skill development, (e) new techniques for leadership
training, and (f) enhanced unit cohesion.

MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

FUTURE DIRECTIONS:

Beyond FY 85, this Program Element will continue exploring other uses of high technology to: (a) enhance unit and team capabilities, and (b) reduce labor intensiveness and costs for such Army activities as broad-scale enlistment testing programs, training in command and control, training in "hands-on" maintenance tasks, and quantifying the impact of leadership on soldiers.

PROJECT OVERVIEW

		84	85
PROJECT: A791-1	MANPOWER, PERSONNEL AND TRAINING	$ 2.9M	$ 3.6M
PE: 62722A	MANPOWER, PERSONNEL AND TRAINING		
CONGRESSIONAL CATEGORY:	MANPOWER & PERSONNEL		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) explore new developments in testing mental aptitudes and skills, (b) provide a basis for the design and development of cost-effective instructional methods for individual soldier skill development, (c) evaluate new techniques for leadership training, and (d) enhance cohesion in units.

The Army in the last part of this century will continue to be faced with a dual manning problem: a dwindling supply of young adults, and heavy demands for high-technology skills for weapon system operation and maintenance. This program will produce the basis for development of more effective methods for recruiting, selecting, training, assigning, and utilizing personnel.

In FY 84, it is planned to: (a) investigate new methods to enhance training effectiveness in command and control, (b) establish a research facility to evaluate computer-administered enlistment tests, (c) investigate computer-based instructional techniques for improving the learning of job skills and English as a second language, (d) initiate research on computer-based unit level instruction (first in Armor job specialties as a test bed), (e) extend the knowledge base for assimilating high technology in operations and management of Army organizations, and (f) continue investigating new approaches to leader development.

In FY 85, it is planned to: (a) evaluate the feasibility of using new computer-based technology for reducing demands for human trainers in maintenance, (b) complete the first large-scale evaluation of computerized administration of enlistment tests, (c) extend leadership development investigations, and (d) continue evaluation of various mathematical and operations research techniques for projecting manpower availability and enlistment decision processes.

This Project supports the Congressional Category of Manpower and Personnel.

PAYOFF/UTILIZATION:

The payoff of this Project includes provision of effective human technology data for developing principles to improve the utilization of the Army's personnel resources.

New advances in understanding human performance will be combined with technological advances such as micro-electronics, to improve the Army's ability to train and utilize soldiers. Improved measurement of human performance capabilities and job requirements, combined with the development of sophisticated allocation models, will improve performance Army-wide.

In FY 83, accomplishments included: (a) a cost-effective methodology for
determining specific factors that influence enlistment, (b) a prototype
method (developed on site at Corpus Christi Army Depot) for assimilating high
technology into Army operations and maintenance systems, and (c)
determination that use of tests of certain specific mental aptitudes and
skills for officer job assignment purposes portends improved performance and
increased retention of high performers.

PROJECT OVERVIEW

		84	85
PROJECT: A791-2	MANPOWER, PERSONNEL AND TRAINING	$ 3.6M	$ 4.4M
PE: 62722A	MANPOWER, PERSONNEL AND TRAINING		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) explore new developments in testing mental aptitudes and skills, (b) provide a basis for the design and development of cost-effective instructional methods for individual soldier skill development, (c) evaluate new techniques for leadership training, and (d) enhance cohesion in units.

The Army in the last part of this century will continue to be faced with a dual manning problem: a dwindling supply of young adults, and heavy demands for high-technology skills for weapon system operation and maintenance. This program will produce the basis for development of more effective methods for recruiting, selecting, training, assigning, and utilizing personnel.

In FY 84, it is planned to: (a) investigate new methods to enhance training effectiveness in command and control, (b) establish a research facility to evaluate computer-administered enlistment tests, (c) investigate computer-based instructional techniques for improving the learning of job skills and English as a second language, (d) initiate research on computer-based unit level instruction (first in Armor job specialties as a test bed), (e) extend the knowledge base for assimilating high technology in operations and management of Army organizations, and (f) continue investigating new approaches to leader development.

In FY 85, it is planned to: (a) evaluate the feasibility of using new computer-based technology for reducing demands for human trainers in maintenance, (b) complete the first large-scale evaluation of computerized administration of enlistment tests, (c) extend leadership development investigations, and (d) continue evaluation of various mathematical and operations research techniques for projecting manpower availability and enlistment decision processes.

This Project supports the Congressional Category of Education and Training.

PAYOFF/UTILIZATION:

The payoff of this Project includes provision of effective human technology data for developing principles to improve the utilization of the Army's personnel resources.

New advances in understanding human performance will be combined with technological advances such as micro-electronics, to improve the Army's ability to train and utilize soldiers. Improved measurement of human performance capabilities and job requirements, combined with the development of sophisticated allocation models, will improve performance Army-wide.

In FY 83, accomplishments included: (a) a cost-effective methodology for determining specific factors that influence enlistment, (b) a prototype method (developed on site at Corpus Christi Army Depot) for assimilating high technology into Army operations and maintenance systems, and (c) determination that use of tests of certain specific mental aptitudes and skills for officer job assignment purposes portends improved performance and increased retention of high performers.

PROGRAM ELEMENT OVERVIEW

PE: 62727A   NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 3.4M (FY85 PRESIDENT'S BUDGET)
                                  FY85 $ 4.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop new training devices that
allow a high transfer of knowledge and experience from the training situation
to a combat situation.

The Army has a continuing need to expand the technology base for training
devices and simulation to support the development of environments and systems
that provide the training required to win any conflict. This exploratory
development program contributes directly to the major Army technology thrust
in Soldier-Machine Interface and provides the technology base to support
future non-system training device developments. Non-system training devices
are developed to provide general military training and training on more than
one item or system. Because modern weapon systems are being integrated into
the force at unprecedented rates, arrival of this sophisticated,
high-technology equipment will coincide with increased constraints on people,
dollars, and time in a training environment where the cost of ammunition and
equipment operations continues to rise. Training devices and training
simulation provide force multipliers that improve combat effectiveness (the
key to both compensating for the numerical superiority of opposing forces and
for maintaining a ready force). This combat effectiveness can best be
achieved by innovative, efficient, and results-oriented training.
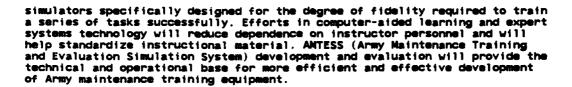
Results/devices of the research from this program normally move to advanced
development under Program Element 63738A (Non-System Training Devices (NSTD)
Development) or to engineering development under Program Element 64715A
(Non-System Training Devices (NSTD) Engineering). Duplication of effort is
avoided through close coordination with other Services and industries
through: (a) Training and Personnel Technology conferences, (b) the Joint
Service Technical Coordinating Group, (c) worldwide staffing of training
device requirements, and (d) the collocation of the Office of the Army
Project Manager for Training Devices (PMTRADE) and the Naval Training
Equipment Center (NTEC) in Orlando, Florida.

PAYOFF/UTILIZATION:

The payoff of this Program Element includes work supporting the development
of simulation concepts for incorporating the full range of U.S. and enemy
weapon systems into engagement simulation exercises.

Development and injection of dirty/obscure effects into battlefield
simulations will improve the overall simulation system interoperability and
logistic support play for engagement simulation exercises. Trainers developed
for institution and unit use will reduce dependence on combat hardware for
training, and improve the diagnostic and troubleshooting capabilities of
maintenance personnel. Simulation of out-the-window tactical scenes, based on
upgraded image generation and display components, will satisfy the training
requirements for aviation flight trainers and ground-based training systems.
Simulated environments technology will permit the fielding of future training

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simulators specifically designed for the degree of fidelity required to train
a series of tasks successfully. Efforts in computer-aided learning and expert
systems technology will reduce dependence on instructor personnel and will
help standardize instructional material. AMTESS (Army Maintenance Training
and Evaluation Simulation System) development and evaluation will provide the
technical and operational base for more efficient and effective development
of Army maintenance training equipment.

FUTURE DIRECTIONS:

Beyond FY 85, efforts to provide a totally integrated battlefield simulation
capability will continue as the requirements for a future generation
engagement simulation system become better defined and as technologies emerge
to support these requirements.

PROJECT OVERVIEW

	84	85
PROJECT: A230 NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY	$ 3.4M	$ 4.5M

PE: 62727A   NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to provide for the exploratory development of training devices that support general military training and training on more than one item or system.

The cost of training with operational equipment, the lack of available training areas, and the need for high levels of proficiency to achieve full combat effectiveness necessitate a continuing technology base that examines high payoff approaches to simulation and training devices. This program provides the necessary "front end" analytical effort needed to transition suitable developments into advanced and engineering development.

In FY 84, it is planned to: (a) use the artificial intelligence (AI) test bed (established as a cooperative effort with the Army Human Engineering Laboratory (HEL), the Army Research Institute (ARI), and the Naval Training Equipment Center (NTEC) in 1983) to experimentally investigate the use of "expert system technology" (i.e., the emulation by computer of the knowledge and thinking processes of a subject matter expert) in various roles now performed by humans and to determine optimum system design characteristics for teaching generic firing skills, (b) continue the computer-generated imagery (CGI) effort with the development of models that portray visual scenes with enough realism for effective use in visual simulators (current CGI systems cannot meet target identification requirements at far ranges because they cannot process enough information to generate high-detail targets or background scenes), (c) continue the cooperative effort with NTEC to develop hybrid interactive visual scenes, emphasizing the use of novel techniques to provide areas of high detail, (d) demonstrate the Simulated Area Weapons Effects (SAWE) chemical protective mask, persistent agent, decontamination simulant, and anti-tank/anti-personnel mines concepts, (e) conduct an effort with the Army Combat Development Experimentation Center (CDEC) to enhance the Multiple Integrated Laser Engagement System (MILES) with an obscured battlefield capability to enable engagement training on a simulated dirty/obscured battlefield, and (f) with ARI and HEL, initiate a functional and structural characterization of training systems in support of the tri-Service computer-based instruction center.

In FY 85, it is planned to: (a) conduct the battlefield sensor simulation program (deferred from FY 84), emphasizing the development of techniques for portraying the characteristics of such sensors as Forward Looking Infrared (FLIR), Target Acquisition and Designation Sight (TADS), and Pilot Night Vision Sensor (PNVS) to provide the technology base for development of simulators for training, surveillance, and target acquisition tasks, (b) expand the SAWE effort to include Field Artillery Scatterable Mines (FASCAM)/grenade simulation concept demonstrations, (c) complete the evaluation of target concepts, (d) conduct thermal signature simulation efforts, (e) integrate the AI functions module and psychophysiological

sensing components with the basic AI test bed and begin validation and experimentation, and (f) with ARI, initiate experiments with an AMTESS (Army Maintenance Training and Evaluation Simulation System) computer-based instruction (CBI) test bed to optimize the use of CBI training devices.

PAYOFF/UTILIZATION:

The payoff of this Project includes basic technology that will lead to more effective training at reduced costs and will provide significant increases in combat power through enhancement of individual and crew proficiency.

In FY 83, accomplishments included: (a) continued efforts to develop a family of SAWE components, with a breadboard fabricator, a successful test of an indirect area fire module, and initiation of concept feasibility demonstrations of chemical and mine simulators (the simulators in the SAWE family will be interoperable with MILES to provide for realistic field training), (b) initiation of a major Army technology base thrust to systematically exploit robotics and AI (a cooperative effort with HEL, ARI, and NTEC), and (c) conclusion of the preliminary systems engineering design effort of the AMTESS concept, with test and evaluation of breadboard models by the proponent schools (the results of which will provide the technical and operational base for more efficient and effective development of Army maintenance training equipment).

PROGRAM ELEMENT OVERVIEW

PE: 63216A   SYNTHETIC FLIGHT SIMULATORS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $12.1M (FY85 PRESIDENT'S BUDGET)
                                FY85 $ 9.1M (FY85 PRESIDENT S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to develop: (a) a highly versatile,
high-fidelity, ground-based, rotorcraft engineering simulator to reduce
development costs and assess qualification certification and safety issues of
rotorcraft systems, and (b) a systems and component simulation capability to
permit analysis of aircraft accident cases for use in accident prevention
programs and for testing proposed aircraft improvements for fielding aircraft
before they are applied to the aviation fleet.

The Army, as the lead Service for helicopter research and development, is
participating in a joint program with the National Aeronautics Space
Administration (NASA) to develop the engineering simulator to support ongoing
and future helicopter development efforts. The simulator will be used to
examine advanced technology systems and components, and man-machine
interfaces early in the development cycle before hardware development. The
investigation of conceptual designs to include preliminary and detailed
design trade-offs, mission capabilities, support of flight test planning, and
man-machine and workload evaluations is an essential and analytical tool for
Army aviation development. This simulation capability will provide the first
real opportunity to accommodate nap-of-the-earth (NOE) experiments through
simulation. Both Projects in this program are part of the Army's technology
thrust into Soldier-Machine Interface.

The Army rotorcraft simulator utilizes the NASA vertical motion simulator at
the NASA Ames Research Center as the basic motion platform. Duplication of
effort is avoided by close coordination with the other Services on a
continuing basis through: (a) joint program reviews, (b) exchange of
technical data and reports, (c) The Technical Cooperation Program (TTCP), (d)
NASA research and technology committees, and (e) the NATO Advisory Group on
Aerospace Research and Development (AGARD).

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) a highly versatile,
high-fidelity, ground-based rotorcraft engineering simulator to support past,
current, and future helicopter development, and (b) a systems and component
simulation capability to meet the need for increased use of flight simulators
to improve pilot training, improve safety, and reduce operating costs through
development of flight simulator components.

These systems will support conceptual design trade-offs, prototype
development, flight tests, product improvement evaluations, analyses of
aircraft accidents, and investigations for accident prevention. This effort
will also increase aviator proficiency in a cost-effective manner by
developing advanced flight simulation components and systems for use in
flight training. Current visual technology used in simulation does not
provide Army pilots with the visual cues necessary for them to operate their
aircraft and engage targets, in an NOE environment. This visual development

effort will provide the Army with the simulated visual capability for
training in a safe manner and at greatly reduced cost: (a) in infrared
systems and in various target acquisition systems, (b) during the day, (c) at
night, (d) in simulated NOE, and (e) in adverse weather.

FUTURE DIRECTIONS:

In FY 86, the advanced cab and visual system (being developed under contract
by American Airlines) and the motion generator will be integrated with NASA's
vertical motion simulator. This will enable the research simulator to
duplicate the movements of an actual aircraft.

PROJECT OVERVIEW

		84	85
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PROJECT: DB34	ROTOR SYSTEM INTEGRATION SIMULATOR (RSIS)	$ 5.1M	$ 3.3M
PE: 63216A	SYNTHETIC FLIGHT SIMULATORS		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	AVRADCOM		

PROJECT SYNOPSIS:

The objective of this Project is to develop the Rotor System Integration Simulator (RSIS) by expanding the capabilities of the National Aeronautics and Space Administration's (NASA's) vertical motion simulator (under a joint Army-NASA agreement).

Numerous studies, including those by the Army Scientific Advisory Panel (ASAP), an ad hoc working group on research facility requirements for nap-of-the-earth (NOE) day/night visual flight studies, recommended that the Army, as the lead Service for helicopter research and development, place increased emphasis on R&D in helicopter flying qualities using ground-based simulation. Use of ground-based simulation techniques in helicopter development will permit more detailed evaluation of engineering concepts before a commitment to aircraft hardware is made, will compress development time, and will reduce costs. The Army-NASA agreement further minimizes costs of a high-fidelity simulator, and allows for increased technical expertise in the development of this Aeronautical Engineering Research Facility.

In FY 84, it is planned to continue contract development of the advanced cab and visual system for RSIS, now being developed by American Airlines. In FY 85, it is planned to initially integrate the advanced cab and visual system to the motion generator. The motion generator system was delivered in FY 82 and tested in FY 83. This highly advanced motion system will enable the research simulator to duplicate the movements of an actual aircraft.

PAYOFF/UTILIZATION:

The payoff of this Project includes reduced rotorcraft systems simulator development costs through correction of rotorcraft integration problems and incorporation of human engineering design criteria during the early stages of the systems development cycle.

Use of ground-based simulation techniques in helicopter development will permit more detailed evaluation of engineering concepts before a commitment to aircraft hardware is made, will compress development time, and will reduce cost. The RSIS is planned to be a highly versatile, high-fidelity, ground-based, rotorcraft engineering simulator to support ongoing and future helicopter development.

In FY 83, accomplishments included: (a) initiation of contract development of the advanced cab and visual system (the contract was signed with American Airlines in FY 82), and (b) acceptance testing of the motion generator system (delivered in FY 82).

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PROJECT OVERVIEW

		84	85
PROJECT: DB39	FLIGHT SIMULATOR COMPONENTS	$ 7.0M	$ 5.8M

PE: 63218A   SYNTHETIC FLIGHT SIMULATORS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to develop and demonstrate advanced flight
simulation techniques and components for incorporation into the design of
future simulators and for improving training capabilities of current
simulators.

This effort is being accomplished through cooperative development with Navy
and Air Force laboratories. Efforts are directed to developing visual
simulation components designed to provide full mission training capability
for nap-of-the-earth (NOE) flight, navigation, gunnery, and survivability in
a combat environment. The current program includes preliminary design studies
and brassboard demonstration for the development of wide-angle, high
resolution, high-pictorial-detail visual simulation techniques that provide
large frontal and downward angle viewing for NOE flight, and integrate
multiple viewpoint sensor displays which are vitally needed for simulating
weapon systems tactical missions and crew integration training. Technology
includes computer-generated image (CGI) edge management techniques for full
mission simulation.

In FY 84, it is planned to continue Phase II of the VSCDP (Visual System
Component Development Program) with a critical design review and coordination
of production, engineering planning, and integrated logistical support for
the developed visual system into the AH-64 combat mission simulator. In FY 85,
it is planned to continue Phase II and demonstrate the capability of the
VSCDP in the combat mission simulator.

PAYOFF/UTILIZATION:

The payoff of this Project includes development of visual simulation
components designed to provide full mission training capability for NOE
flight, navigation, gunnery, and survivability in a combat environment.

These simulation devices will enhance the navigational and target recognition
and acquisition skills of rotorcraft system crews, thereby increasing the
combat readiness and proficiency of the Army's aviation community. Visual
technology developed in this program will be applied to all air and ground
base simulators to improve the quality of training, and reduce the training
and acquisition costs.

In FY 82: (a) contracts were let with General Electric, Honeywell Inc., and
Singer Link for each to develop and demonstrate its respective
Computer-Generated Imagery (CGI) System, and (b) fabrication of an interim
Sodern Titus Light Valve Projector for use in Phase II of the VSCDP was
initiated. In FY 83, accomplishments included: (a) completion of Phase I of
VSCDP, (b) initiation of Phase II, and (c) award of contracts to Honeywell

and General Electric to continue hardware development in a competitive
evaluation.

PROGRAM ELEMENT OVERVIEW

PE: 63731A   MANPOWER AND PERSONNEL

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: ARMY RESEARCH INSTITUTE

FUNDING: FY84 $ 9.8M (FY85 PRESIDENT'S BUDGET)
                                FY85 $17.0M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide for research to develop
and evaluate: (a) methods for attracting needed personnel to the Army,
selecting the most qualified, and assigning them to jobs (Military
Occupational Specialties) that capitalize on their aptitudes and vocational
interests, (b) programs for retaining highly qualified personnel, and (c)
programs for developing cohesive units and the leaders needed to assure
combat readiness in the high-technology Army environment.

This advanced development program will improve the Army's capability to
specify personnel requirements and skill mixes earlier in the weapon systems
development cycle and correlate these requirements with available manpower.
This Program Element (PE) is the Army's response to the Congressional
requirement for a DoD-wide effort to relate selection criteria to successful
on-the-job performance.

This work is coordinated with PE 62763N (Naval Personnel Support Technology),
PE 63707N (Navy Manpower Control System Development), and PE 62703F (Air
Force Personnel Utilization Technology). Technology input is provided by PE
62722A (Manpower, Personnel and Training). To avoid duplication of effort,
Tri-Service technical advisory groups coordinate Service developments in
education and training, manpower, personnel, and organizational
effectiveness. Cooperative efforts with the Navy and Air Force are conducted
in the areas of the Armed Services Vocational Aptitude Battery (ASVAB) and
refining measurement of on-the-job operational performance.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved methods for
selecting and utilizing soldiers and for determining the effects of manpower
demands of new systems upon the available manpower supply, (b) models for
projecting personnel resources and for allocating resources to requirements,
(c) techniques for attracting needed personnel into the Army and for
assigning them to Military Occupational Specialties that make use of their
aptitudes and interests, (d) programs for retaining highly qualified
personnel, and (e) programs for developing cohesive units and the leaders
needed to assure effective combat readiness in the high-technology Army
environment.

These efforts can potentially save the Army more than $150 million a year in
costs associated with attrition and retraining.

FUTURE DIRECTIONS:

Doctrine for Air/Land Battle 2000 makes it mandatory that manpower and
personnel research continue through the 1980s. Beyond FY 85, it is planned to

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continue efforts to: (a) develop systems for allocating personnel to occupational specialties and for counseling prospective recruits, (b) evaluate the ASVAB as a predictor of soldier job performance, (c) develop better selection and assignment instruments, (d) find ways to increase reenlistment rates for highly qualified soldiers and reduce attrition, and (e) provide for faster and better assimilation of soldiers into units.

PROJECT OVERVIEW

		84	85
PROJECT: A792-1	MANPOWER AND PERSONNEL	$ 9.8M	$17.0M
PE: 63731A	MANPOWER AND PERSONNEL		
CONGRESSIONAL CATEGORY:	MANPOWER & PERSONNEL		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:
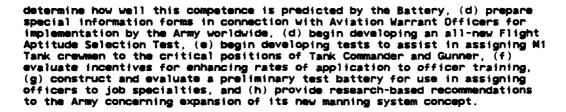
The objectives of this Project are to: (a) develop performance criteria and job aids so the Army can efficiently specify quantities and characteristics of the nation's manpower pool, recruit them, and assign them to appropriate jobs, (b) evaluate the quality and effectiveness of the new enlistment aptitude test battery (the ASVAB, Armed Services Vocational Aptitude Battery) for predicting soldier job performance, (c) develop and issue techniques to reduce attrition and to increase reenlistment rates for highly qualified soldiers, and (d) provide means for increasing the speed and quality of assimilation of replacement soldiers into units.

Approaching the year 2000, the number of military-age people in the population will be 20 percent fewer than at present. Associated with this decline will be the drop in numbers of high school graduates, who are highest performers and have lowest attrition rates. The Army must develop ways of attracting larger proportions of these high quality individuals and must improve procedures for their selection and job utilization.

In FY 84, it is planned to: (a) construct the final two modules of an experimental enlisted personnel allocation system (to advance the mathematically-based operations research on personnel forecasting, planning, and allocation among Army enlisted personnel jobs), (b) conduct econometric modeling of enlistment and reenlistment decision processes (to provide manpower pool estimates through the year 2000, refined by ethnic group compositions, and to determine the relative importance for enlistment/reenlistment of a variety of economic indicators), (c) continue research on new management techniques to improve recruiting, (d) publish several reports on the usefulness of the ASVAB and alternative ways of using the different scores of the tests of this battery, (e) investigate computerized testing of certain skills, (f) complete the development of a revised form of the Flight Aptitude Selection Test and evaluate the test's utility for predicting performance in flight training, in support of Army aviation, (g) evaluate the impact of new physical standards for rotary wing training, (h) provide recommendations for the Army's management of enlisted attrition and prepare a large-scale survey to identify factors for enhancing retention of high performing officers, (i) complete a full set of automated leadership training materials for officers and begin developing tests and computer programs to make improved person-job matches of officers to their job specialties, and (j) complete a survey measuring cohesion and effectiveness in units in the Army's new manning concept and begin analyzing results.

In FY 85, it is planned to: (a) complete a working prototype of a sophisticated system for allocation of personnel to occupational specialties, (b) begin developing a computerized Army job information system for counseling prospective recruits, (c) continue evaluation of the ASVAB by preparing soldier competence tests for nine occupational specialties to

determine how well this competence is predicted by the Battery, (d) prepare special information forms in connection with Aviation Warrant Officers for implementation by the Army worldwide, (d) begin developing an all-new Flight Aptitude Selection Test, (e) begin developing tests to assist in assigning M1 Tank crewmen to the critical positions of Tank Commander and Gunner, (f) evaluate incentives for enhancing rates of application to officer training, (g) construct and evaluate a preliminary test battery for use in assigning officers to job specialties, and (h) provide research-based recommendations to the Army concerning expansion of its new manning system concept.

PAYOFF/UTILIZATION:

The payoff of this Project includes improved Army ability to identify personnel requirements early in weapon systems development and to relate the available manpower pool to these requirements in order to maintain high levels of combat readiness.

In FY 83, accomplishments included: (a) completion of mathematical models of economic determinants of Army enlistment that indicate expected gain or loss in recruiting associated with each one percentage point rise or fall in unemployment and wage rate differentials between Army and civilian jobs, (b) evaluation of the usefulness of a test to screen out high attrition-risk enlistment applicants, (c) progress on a test for aviation personnel, (d) development and deliverance to the Army of a new and superior test for selection of commissioned officers, (e) verification of the utility to the Army of the currently operational forms of the joint-Services enlistment test battery (ASVAB) for a major set of Army enlisted jobs, (f) analysis of Army reenlistment standards and identification of the most significant factors in reenlistment decisions, (g) evaluation of the usefulness of strength and stamina tests as selectors for specific Army jobs, (h) completion of the first steps in the Army's near-term solution to estimating personnel and training demands of weapon systems while in the design phases, and (i) installation of a prototype survey system to measure cohesion and effectiveness in units under the Army's new manning concept.

PROGRAM ELEMENT OVERVIEW

PE: 63738A   NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 2.4M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 6.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide for the advanced
development of Non-System Training Devices (NSTD), which are needed to
support general military training and training on more than one item or
system (in contrast to system devices that are developed in support of a
specific item or system).

The combat effectiveness of Army personnel is the key to both compensating
for the numerical superiority of opposing forces and for maintaining a ready
force. This combat effectiveness can best be achieved through innovative,
efficient, and results-oriented training. Modern training devices can provide
the means to accomplish the required training in a cost-effective manner. The
major thrust in the development of new training devices is to maximize the
transfer of knowledge, skills, and experience from the training situation to
a combat situation.

The devices in this program have normally progressed to this Program Element
(PE) from exploratory development under PE 62727A (Non-System Training
Devices (NSTD) Technology) and normally continue to engineering development
under PE 64715A (Non-System Training Devices (NSTD) Engineering). Duplication
of effort is avoided through close coordination with other Services through:
(a) Training and Personnel Technology Conferences, (b) a Joint Service
Technical Coordinating Group, (c) worldwide staffing of training device
requirements, and (d) the collocation of the office of the Project Manager
for Training Devices (PMTRADE) and the Naval Training Equipment Center (NTEC)
in Orlando, Florida.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved combat
effectiveness by providing more realistic combat scenarios during training,
(b) a well-trained, ready force prepared to fight and defeat a numerically
superior adversary, and (c) reduced training costs.

Modern weapons systems are being integrated into the force at unprecedented
rates. Arrival of this sophisticated, complex equipment coincides with
increased constraints on people, dollars, and time in a training environment
where ammunition and fuel costs continue to rise. Training devices and
training simulation provide force multipliers that improve combat
effectiveness by providing more realistic training.

FUTURE DIRECTIONS:

In the future, this Program Element will continue to provide advanced
development for non-system training devices to improve training realism and
reduce training costs.

FUTURE DIRECTIONS:

In the future, this Program Element will continue to provide advanced
development for non-system training devices to improve training realism and
reduce training costs.

PROJECT OVERVIEW

		84	85
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PROJECT: A224	NON-SYSTEM TRAINING DEVICES (NSTD) ARMOR/ANTI-ARMOR	$ 2.4M	$ 2.5M

PE: 63738A   NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to develop armor/anti-armor training devices including the Crew Group Trainer, a device that provides a simulator for classroom training for various infantry-fired anti-armor missile systems.

In FY 84, it is planned to: (a) continue advanced development on the Crew Group Trainer (funds were reprogrammed from Program Element 64715A (Non-System Training Devices (NSTD) Engineering) in FY 83 to accelerate advanced development of this device), (b) initiate an advanced development effort on the Full Armor Crew Training Simulator (FACTS), and (c) design, fabricate, and test a prototype of the FACTS for the M60A1 tank. This program will provide the Army with integrated full crew tank gunnery training with laser reactive targets, a videodisk-based gunnery tasks trainer, a diagnostic dry fire feedback and recording system, a loader trainer, and a target engagement simulator which will significantly increase training effectiveness without increasing the amount of tank main gun ammunition expended. The Scaled Range Target System (SRTS) previously planned to begin in FY 84 was deferred as a result of reprioritization of projects within the NSTD program.

In FY 85, it is planned to: (a) conduct advanced development on the Tank Weapons Gunnery Simulation System (TWGSS), and (b) fabricate and test TWGSS prototypes. This program will provide precision laser gunnery capability for tank gunnery training during force-on-force engagement exercises and during portions of annual tank gunnery training at training ranges. This system will be incorporated into the FACTS.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) a simulator for classroom training for various infantry-fired anti-armor missile systems (the Crew Group Trainer), (b) an integrated full crew tank gunnery training capability (FACTS), and (c) a precision laser gunnery capability for tank gunnery training during force-on-force engagement exercises and during portions of annual tank gunnery training at training ranges (TWGSS).

These systems will improve combat effectiveness by providing more realistic combat scenarios and will reduce training costs by decreasing the amount of resources (people, dollars, and time) expended.

PROJECT OVERVIEW

	84	85

PROJECT: A225   NON-SYSTEM TRAINING $ 0.0M $ 3.6M
                  DEVICES (NSTD)
                  ARTILLERY/AIR DEFENSE
                  ENGINEER

PE: 63738A   NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to fabricate and test the Simulation of Area
Weapons Effects for Field Artillery Indirect Area Fire (SAWE-IAF).

This program will enable field artillery units to participate in Multiple
Integrated Laser Engagement System (MILES) engagement field exercises and
provide more realistic force-on-force training by simulating the weapons
effects and casualty-producing effects of field artillery cannon fire on the
battlefield.

PAYOFF/UTILIZATION:

The payoff of this Project includes realistic force-on-force training by
simulating weapons effects and casualty-producing effects of field artillery
cannon fire on the battlefield.

PROGRAM ELEMENT OVERVIEW

PE: 63739A   HUMAN FACTORS IN TRAINING AND OPERATIONAL
EFFECTIVENESS

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 4.2M (FY85 PRESIDENT'S BUDGET)
FY85 $10.4M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop and evaluate methods to
improve interfaces between soldiers and the complex weapons and equipment
they operate and maintain.

Work under this Program Element will provide behavioral sciences research
support to the Army's major technology thrust in the design of improved
soldier-machine interfaces. Specifically, user-friendly methods will be
developed that shift routine, procedural, operator/maintainer tasks to
hardware. These man-system interfaces will make operational and maintenance
tasks easy for the user and reduce training requirements. Designs of improved,
computer-based command, control, and communication (C3) systems will be
investigated to permit unit command staffs to make tactical decisions more
efficiently. Also, the concept of building a simulation training capability
directly into operational computer-based systems ("embedded" training) will
be evaluated.

Duplication of effort is avoided through close coordination of research
through: (a) annual DoD technical and apportionment reviews, (b) membership
on tri-Service committees (such as the Human Factors Technology Coordination
Group, the Human Factors Test and Evaluation Subgroup, and the DoD/National
Aeronautics and Space Administration (NASA) Simulation Working Group), (c)
participation on the NATO Working Group on Fidelity Requirements of Flight
Simulation and the Technical Cooperation Program (TTCP) Panel on Human
Factors in Command and Control Systems, and (d) direct coordination with the
Air Force Human Resources Laboratory (AFHRL), the Navy Personnel Research and
Development Center (NPRDC), the Army Project Manager for Training Devices
(PMTRADE), the Army Human Engineering Laboratory (HEL), and the Naval
Training Equipment Center (NTEC), to cover related research in visual
displays, training simulation, human factors in operational testing, and
aviation crew performance.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) man-system interfaces that
will make operation and maintenance tasks easy for the user and reduce
training requirements, (b) improved, computer-based C3 systems that will
adaptively tailor information amount, format, and level of detail to permit
unit command staffs to make tactical decisions more efficiently, (c)
evaluation of the concept of "embedded training" (building a simulation
training capability directly into operational computer-based systems), (d) a
comprehensive set of human factors guidelines and criteria for evaluation of
the design of the soldier-machine interface in battlefield automated systems,
and (e) the application of human factors principles in the early stages of
weapons and systems design to ensure that the demands of these weapons and
systems will not exceed the capabilities of the soldiers assigned to operate
them.

FUTURE DIRECTIONS:

Beyond FY 85, it is planned to: (a) develop and evaluate methods to minimize the soldier training time and cost for multi-station operation (such as weapon system engagement and information control systems), (b) predict maintenance training requirements early in system acquisition, (c) test life cycle cost-effectiveness models for use in design decisions concerning soldier-machine interfaces, and (d) evaluate the applicability of Artificial Intelligence (AI) to new systems.

PROJECT OVERVIEW

	84	85
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PROJECT: A793	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS	$ 4.2M $10.4M
PE: 63739A	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS	
CONGRESSIONAL CATEGORY:	HUMAN FACTORS	
DoD ORGANIZATION:	ARMY	
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE	

PROJECT SYNOPSIS:

The objective of this Project is to develop and evaluate new methods to
ensure that systems are designed to be compatible with and take maximum
advantage of soldier capabilities by: (a) using in-house test beds to
determine appropriate tasks for humans and equipment in future systems for
air defense and command and control, (b) evaluating the concept of
"embedding" a training capability within systems and developing design
criteria for such training systems, (c) developing and evaluating improved
methods for command staff training in command and control systems, and (d)
developing and evaluating a comprehensive set of human factors guidelines and
criteria for evaluation of the design of the Soldier-Machine Interface in
battlefield automated systems.

Force modernization is one of the Army's critical objectives over the next
decade. The Army has over 200 new systems (including 40 major systems)
programmed for acquisition in the next 18 years. The capabilities and
limitations of soldiers, as integral parts of the weapon systems, must be
determined and considered early in weapons system development.

In FY 84, it is planned to: (a) prepare a comprehensive report on methods for
determining manpower and personnel requirements of new systems, (b) continue
research to provide a method for estimating personnel and training demands of
emerging weapon systems by assessing acceptability (for Army purposes) of a
procedure developed by the Navy (HARDMAN), and by conducting intensive
retrospective analysis of the Stinger Anti-Aircraft Weapon, the Multiple
Launch Rocket System, the UH-1 Blackhawk Aircraft, and test equipment for the
M1 tank, (c) develop improved techniques for information management in
automated battlefield systems and field test criteria for evaluating human
factors aspects of the design of these systems, (d) evaluate the
effectiveness of prototype aircrew training manuals, (e) field test improved
tactical symbols for use in computerized battlefield and simulation systems,
and (f) identify human factors implications of the doctrine of Air/Land
Battle 2000 and the Distributed Battlefield.

In FY 85, it is planned to: (a) evaluate embedded training technology
incorporated in specific demonstration systems, and evaluate analyses of
specific points of similarity and difference in the development of manning
and training plans for the Stinger, Multiple Launch Rocket System, UH-1
Blackhawk Aircraft, and the test equipment subsystem for the M1 tank, (b)
continue development of improved techniques for information management in
automated battlefield systems, (c) apply previously developed human
performance data and evaluate resulting improvements to electronic and
computer controlled systems, (d) develop a model to apply embedded training
as part of the system development process using the Fiber Optic Guided

Missile as a test bed, (e) evaluate the use of artificial intelligence and "fault-tolerant" design in vehicular-contained tactical command and control systems, (f) apply and evaluate results of previous research on human performance in automated systems in certain electronic systems for providing battlefield information to small unit commanders, and (g) develop and evaluate a data management/display system that can adaptively tailor the amount, format, and level of detail to that which the command requires for the battlefield situation.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) techniques for early identification of system training requirements based on the needs of the human operators/maintainers, (b) specification of appropriate approaches for new system training, (c) design specifications for training systems that can be "embedded" as an integral part of operational systems, (d) methods for task estimation and description early in systems development, (e) a comprehensive set of human factors guidelines and criteria for evaluation of the design of user/operator transactions in battlefield automated systems, and (f) identification of soldier performance requirements, related training requirements, and better methods for command staff training in command and control systems.

In FY 83, accomplishments included: (a) development of a system for realistic Air Defense Engagement simulation, resulting in increased forward air defense system effectiveness through improved operator performance, (b) completion of a case study of the development of a current Army ground-to-air defense system (Stinger), resulting in a generalized procedure for inclusion of human factors issues early in the system acquisition process, and (c) development and evaluation of a training procedure, automated decision aids, and a handbook for analysis of battlefield intelligence information.

PROGRAM ELEMENT OVERVIEW

PE: 63743A   EDUCATION AND TRAINING

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 7.6M (FY85 PRESIDENT'S BUDGET)
                                  FY85 $11.7M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop and evaluate expanded
applications of computer and electronic technology to reduce the cost of
training while increasing the proficiency of the soldier trained by these new
technologies.

In FY 84, the Army is spending over $5.3 billion for classroom training. This
program is designed to assure that maximum benefits are derived from the
investment. Specifically, this program will develop training
methods/techniques/systems that lead to: (a) reduced training time, (b)
improved job performance, (c) less expensive training, (d) fewer training
support personnel (both in Army schools and units), and (e) effective
training management. Research will concentrate on crew and unit training for
the combat arms, Reserve Component training, maintenance training, pilot
training, and leader development.

Work comes to this Program Element (PE) from exploratory development efforts
conducted under PE 62722A (Manpower, Personnel and Training). Duplication of
effort is avoided within the Army through annual Technology Base Reviews
chaired by the Director of Army Research and Technology and within the DoD by
annual Apportionment and Technical Reviews, and participation in advisory
groups. This research is coordinated directly with other Service R&D
organizations (including the Air Force Human Resources Laboratory (AFHRL),
the Navy Personnel Research and Development Center (NPRDC), the Project
Manager for Training Devices (PMTRADE), and the Naval Training Equipment
Center (NTEC)) through the Manpower and Training Research Information System
(MATRIS) and through memoranda of understanding with PMTRADE, the U.S. Army
Training Developments Institute, and the U.S. Army Soldier Support Center.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) increased readiness through
the development of improved, more cost-effective individual and
crew/group/team training techniques, (b) more precise identification of
essential skills, and (c) more extensive utilization of technology advances
for performance-based training and evaluation.

This research supports Army-wide requirements to develop training techniques
that realistically address combat readiness requirements and that maximize
the benefits derived from the Army's substantial investment in training.

FUTURE DIRECTIONS:

In the future, this advanced development effort will continue to apply
expanded applications of computer and electronic technology to Army school
and unit training, Reserve Component training, maintenance training, pilot
training, and leader development.

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PROJECT OVERVIEW

		84	85
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PROJECT: A794-1	EDUCATION AND TRAINING	$ 7.6M	$11.7M
PE: 63743A	EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objective of this Project is to investigate, in close association with
the intended Army operational user, the cost-effective application of
computers and related electronic technology to training, in order to: (a)
reduce training time, costs, staff, facilities, and travel, and (b) provide
equivalent or more highly proficient soldiers.

The Army conducts the largest training institution in the free world.
Approximately one soldier in ten is in training at any given time. All new
enlistees must be given Basic Combat Training. Job-related training must then
be given in 356 Military Occupational Specialties (MOSs). In units, the Army
must provide job-related training to augment and refresh individual skills,
and training to make individuals into members of cohesive units. The Army's
training mission is expensive: the Training and Doctrine Command (TRADOC)
projects it will spend $5.3 billion for "school house" training in FY 1984,
and the cost of training in units is probably several times higher. Current
training is also personnel-intensive: the Army estimates that a total of 87,000
individuals will be utilized in support of individual training in FY 84.
Specific training areas upon which this Project is focussed include: (a)
basic job skills training to prepare the educationally disadvantaged to
succeed in Army jobs, (b) job-specific MOS skills (with special emphasis on
maintenance, combat, and aviator skills), (c) collective (crew, team, and
unit) training for the combat arms, (d) training for the Reserve Components
(recognizing their special training constraints), (e) techniques for
objectively measuring individual and unit performance, and (f) techniques for
more effective training management, with special emphasis on units.

In FY 84, it is planned to: (a) conduct research on training techniques for
basic job skills for educationally disadvantaged soldiers, on aviator
training and proficiency evaluation, and on unit training and training
management techniques for the Advanced Technology Light Division at Fort
Lewis (all of this research involves applying electronic technology to
training and has the highest priority in the program), (b) expand development
of computer-based, hand-held, instructional devices for job-related
vocabulary and job-related mathematics training, (c) conduct an effort in
support of Phase II development of the Army's National Training Center by
analyzing "real-world" tactical performance data derived from the battalions
that receive two weeks of realistic training at the Center and by providing
these data to the Combined Arms Center at Fort Leavenworth for assessment of
training quality and the effectiveness of various tactics, (d) research
techniques for enhancing officer leadership development, (e) determine
combat-related training requirements for individual and crew-served weapons,
(f) research land navigation training, (g) develop training methods for the
combat arms leader, and (h) develop and evaluate a microcomputer-based
Battalion Training Management System.

In FY 85, it is planned to: (a) increase the emphasis on the cost-effective

application of emerging state-of-the-art electronic technology for solving training problems, (b) investigate the generalizability of training techniques originally developed for a single specific purpose (e.g., the expanded use of hand-held vocabulary tutors as job aids or for training in the Reserves), (c) increase efforts in support of the Army's Combined Arms Center to develop methods for analyzing more and more "real-world" unit performance data from battalions receiving two-week training at the National Training Center (analyses will include comparison of performance of units employing different tactical doctrines, having different unit organizations, or having different training histories), (d) develop computer-based instructional techniques for Reserve Components, (e) develop methods and programs for accomplishing better individual and crew-served weapons training, and (f) develop training methods to better prepare the leaders of small combat units for their tactical missions.

PAYOFF/UTILIZATION:

The payoffs of this Project include development of training methods/techniques/systems utilizing state-of-the-art computer and electronic technology to: (a) reduce training time, training costs, and personnel and facilities requirements, (b) make the greatest use of the Army's expenditure of funds for training, (c) increase soldier proficiency, (d) improve training management effectiveness, and (e) improve individual and unit performance measurement.

In FY 83, accomplishments included: (a) completion of sustainment training programs for M1 Abrams Tank crews and implementation of them into five battalions, (b) development of similar programs for battalions operating M60A3 Tanks, (c) development of tank platoon training procedures, (d) development of drill training guides for assault gun crews/platoons/battalions, and light attack and light motorized squads/platoons/battalions, (e) analysis of the training requirements for units operating the AH-1, AH-64, AH-1S, OH-58, OH-58 B(AHIP) helicopters, (f) evaluation of the effectiveness of an aviator training program designed to requalify Reserve aviators who have been off flight status for a year or more, (g) development of a unit rifle marksmanship training guide, (h) development of an enhanced program of instruction for the M60 machine gun, and (i) development of a hand-held vocabulary tutor for training new soldiers who require specialized training in the vocabulary of their MOSs before they can benefit from the standard Advanced Individual Training (AIT).

PROGRAM ELEMENT OVERVIEW

PE: 63744A   TRAINING SIMULATION

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 3.0M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 4.8M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to carry out the experiments
necessary to provide a scientific basis for the design of lower cost, less
complex simulators and training devices.

Training using operational equipment and live ammunition is expensive: a
single Stinger anti-aircraft missile costs $60,000, and the cost of operating
an M1 tank is over $500 an hour. There is also a lack of suitable area for
realistic combat training, especially for the Army in Europe. Weapon system
complexity poses a special challenge for the training of operators,
maintainers, leaders, and unit command staffs. Small and relatively
inexpensive simulators and training devices are needed by units in the field,
and they must be easy to install and maintain. Earlier research has shown
that it is not always necessary for simulators to highly resemble operational
equipment to achieve required levels of training and job performance. Hence,
this program will focus on three high priority training areas: helicopter
flight training, maintenance training, and tactical training for units in the
field. The results of this work will be provided to the U.S. Army Materiel
Development and Readiness Command's (DARCOM's) Project Manager for Training
Devices (PMTRADE) and to the U.S. Army Training and Doctrine Command (TRADOC).

Work comes to this Program Element (PE) from exploratory development efforts
on simulators and training devices conducted under PE 62717A (Human
Performance Effectiveness and Simulation). Duplication of effort within the
Army is avoided by annual Technology Base Reviews chaired by the Director of
Army Research and Technology, and within the DoD by annual Apportionment and
Technical Reviews, topical reviews, and participation in advisory groups.
This simulation and training device research is coordinated directly with
other Service R&D organizations (including the Defense Advanced Research
Project Agency (DARPA), PMTRADE, the Air Force Human Resources Laboratory
(AFHRL), the Navy Personnel Research and Development Center (NPRDC), and the
Naval Training Equipment Center (NTEC)), and through Memoranda of
Understanding between ARI and DARPA, PMTRADE, AFHRL, NPRDC, the U.S. Army
Training Support Center, and the U.S. Army Training Developments Institute.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include scientifically-based
recommendations for the design of simulators and training devices that: (a)
are less complex and sophisticated, (b) are smaller and sometimes portable,
(c) are easy to install and maintain, (d) will potentially reduce the cost of
simulators to less than one-tenth of their current costs, (e) substitute for
actual equipment in training while still providing the required levels of
training and job performance, and (f) provide realistic training to maintain
a combat-ready force.

Emphasis will be placed on simulator and training device design for
maintenance training, aviator training, and unit command staff training.

Results of all work will be provided to PMTRADE and TRADOC.

FUTURE DIRECTIONS:

Research goals for FY 86 and beyond will continue to focus upon the design and development of cost-effective, low-complexity simulators and training devices. Central to continuing work in this effort will be the development of three computer-based, in-house test bed facilities, where prototypes will be built and evaluated. Research findings will be translated into recommendations for the Army-wide implementation of cost-effective and training-efficient technology.

PROJECT OVERVIEW

		84	85
PROJECT: A795	TRAINING SIMULATION	$ 3.0M	$ 4.8M
PE: 63744A	TRAINING SIMULATION		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objective of this Project is to provide the Army's Training and Doctrine
Command (TRADOC) and its Project Manager for Training Devices (PMTRADE) with
scientifically-based recommendations for the design of lower-cost,
lower-complexity simulators and training devices.

The need for effective simulation and training devices is increasing in order
to reduce the high cost of using actual equipment for training. The need for
simulation and training devices in units is particularly important. The
experimental results of this Project will provide information concerning how
necessary levels of performance can be achieved with less sophisticated and
less expensive simulators and training devices. Work efforts will focus on
simulator and training device design for maintenance training, aviator
training, and unit command staff training.

In FY 84, it is planned to: (a) conduct experimental research to assist
trade-offs between physical realism in simulation and design complexity, (b)
determine guidelines for more effective use of command and control battle
simulations and preliminary design recommendations for enhancement of a
microprocessor-based battle simulation, (c) determine and specify aviation
unit simulation requirements, and (d) develop preliminary recommendations for
the design of a trainer for the leader in the Bradley Infantry Fighting
Vehicle.

In FY 85 (and beyond), it is planned to: (a) develop three computer-based,
in-house research facilities ("test-beds") for conducting applied research on
the design of more cost-effective simulation and training devices for
maintenance, aviator, and command and control training, (b) build and
evaluate prototypes, and (c) if they are cost-effective, recommend Army-wide
implementation.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) development of modern simulation and
training technologies which can result in significant savings and
improvements in the areas of maintenance, aviation, and command and control
training, (b) guidance to TRADOC and PMTRADE in their work on the design of
more cost-effective simulators and training devices, (c) development of
alternatives to the use of high-cost, operational systems for training and
maintaining the skills required of a combat-ready force, and (d) potential
reduction of the cost of simulators to less than one-tenth of their current
costs.

In FY 83, accomplishments included: (a) evaluation of the Army Maintenance
Training and Evaluation Simulation System, (b) development of a method for
objectively measuring battalion staff performance during battle simulation

training exercises, (c) development of a user-oriented guidebook for more
accurately measuring training device effectiveness, (d) development of
preliminary guidelines for design of less costly maintenance simulators, and
(e) detailed guidelines for the development of cost-effective methods for
training in combat vehicle identification.

PROGRAM ELEMENT OVERVIEW

PE: 64217A   SYNTHETIC FLIGHT TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $12.7M (FY85 PRESIDENT'S BUDGET)
                              FY85 $14.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop high-fidelity operational
flight, weapon, and combat mission environment helicopter simulators to
support initial entry rotary-wing training and combat operational training.

This simulator development provides for realistic and cost-effective training
by replicating the combat environment for tactical flight, by including
nap-of-the-earth (NOE), weapons engagement, and enemy interaction. The
simulators are used to complement the training accomplished in actual
helicopters during formal courses of instruction and for maintenance of
combat readiness for rated aviators.

In FY 84, development will continue on the AH-64 combat mission simulator.

In FY 85, it is planned to complete development on the AH-64 simulator and
begin an initial concept study for the LHX Synthetic Flight Training System.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) a reduction in operations
and support cost, and (b) a better trained pilot.

The simulators are used to complement the training accomplished in actual
aircraft during formal courses of instruction and for maintenance of combat
readiness by rated aviators. Each hour flown in a simulator offsets an hour
which would have been flown in an aircraft. An hour in an AH-64 aircraft will
cost approximately $3000, while the simulator will cost less than $600 per
hour. Each simulator will be used 3645 hours per year, and therefore, each
simulator reduces annual operations and support cost by $8,748,000
(3000-600=2400x3645), while concurrently providing a better trained pilot.
The reduction in operations and support cost is included in the Army's flying
hour program request.

Three simulators developed under this program have reached the production
stage. The instrument flight and emergency simulator, modeled after the UH-1
helicopter, is in service at 17 locations worldwide. The second simulator, a
transition and combat readiness model for pilots of the CH-47 helicopter,
with five units begun in FY 79, has demonstrated a cumulative transfer
effectiveness of 0.85 to 1 in operational testing. Development of the third
simulator, for the AH-1 helicopter, has now been completed and production was
begun in FY 81.

FUTURE DIRECTIONS:

The combat mission simulator being developed for the AH-64 attack helicopter
is being accomplished by extending the technology achieved in the previous
development of the UH-1, CH-47, AH-1, and UH-60 helicopter simulators. The

future direction for this Program Element is to continue development of all Army prototype flight simulators.

PROJECT OVERVIEW

	84	85
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PROJECT: D275   SYNTHETIC FLIGHT $12.7M $14.1M
TRAINING SYSTEMS

PE: 64217A   SYNTHETIC FLIGHT TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to develop a family of high-fidelity
operational flight, weapon and combat mission helicopter simulators to
support initial entry rotary-wing training and combat operational training.

A major thrust is the development of a simulation of the combat environment
for tactical flight, including nap-of-the-earth (NOE), weapons engagement,
and enemy interaction, to provide realistic and cost-effective training in a
totally safe environment. The simulators complement the training accomplished
in actual helicopters during formal courses of instruction and for
maintenance of combat readiness by rated aviators. Each simulator is a
replica of the helicopter cockpit, mounted on a motion system, plus an
instructor's station with the equipment necessary for the instructor to
control the training scenario, the operating environment, and the measurement
of the pilot's performance. Each simulator has a visual system to provide the
aircrew with a view of the terrain outside the helicopter.

The Project has been initiated with an approach designed to expedite delivery
of an interim simulator to the training, i.e., training the crew members to
fly and to shoot using the sophisticated sensor equipment on board the
aircraft without reference to an out-the-window visual scene. All AH-64A
flight and weapons systems required for aircrew training will be incorporated
in the simulator, including the gunner's Target Acquisition Designation
Sensor (TADS) and the Pilot's Night Vision Sight (PNVS). A parallel effort
will be initiated to develop a sophisticated high detail, wide angle
out-the-window visual system. This system will be retrofitted to the interim
trainer after having been tested on the first production simulator, thus
providing a full combat mission simulator capability at a training base.

In FY 84, work will continue on development of the Combat Mission Simulator
for the Attack Helicopter. Work breakdown includes: (a) hardware and software
design and development, (b) hardware and software integration, (c) system
engineering and technical control, (d) technical contract data, (e) logistic
support and procurement, and (f) system support and assembly.

In FY 85, it is planned to complete development of the AH-64 Combat Mission
Simulator, to include in-plant testing, tear-down, and installation at Fort
Rucker, AL, and begin an initial concept study for the LHX Synthetic Flight
Training System and an aviation team trainer.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the AH-64 Combat Mission Simulator
will be the first training simulator capable of simulating the full combat
mission, including hostile enemy interaction, and (b) if simulators were not

available, the Army would fly the aircraft those hours that would have been spent in the simulator and, therefore, would incur a considerably greater training expense.

PROGRAM ELEMENT OVERVIEW

PE: 64715A   NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

FUNDING: FY84 $12.6M (FY85 PRESIDENT'S BUDGET)
                              FY85 $34.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide for the engineering
development of Non-System Training Devices (NSTD).

NSTD are developed to support general military training and training on more
than one item or system, rather than a single item or system. Modern weapons
systems are being integrated into the force at unprecedented rates. Arrival
of this sophisticated, complex equipment coincides with increased constraints
on people, dollars, and time in a training environment where ammunition and
fuel costs continue to rise. Training devices and training simulation provide
force multipliers that can improve effectiveness and provide more realistic
training while helping to control rapidly escalating costs. The combat
effectiveness of Army personnel is key to both compensating for the numerical
superiority of opposing forces and for maintaining a ready force. This combat
effectiveness can only be achieved by efficient and results-oriented
training. The major thrust is to develop devices that allow a high transfer
of knowledge from training to a combat situation.

The program is divided into five Projects, three of which support engineering
development of training devices in the functional areas of infantry,
armor/anti-armor, and combined arms. The fourth Project supports engineering
development of training devices encompassing the functional areas of
artillery, air defense, and engineering items. The fifth Project provides
funds for the Office of the Project Manager for Training Devices (PMTRADE)
and for a joint Army/Navy agreement which enables the Army to use the
resources of the Navy Training Equipment Center (NTEC). The training devices
produced as a result of this program are in two categories: engagement
simulation and marksmanship systems.

Four of the devices that are under development within this Program Element
include: (a) the Remote Target System (RETS), which provides an integrated
solution to the small arms marksmanship target needs of the infantry
community, (b) the Crew Group Trainer, which is a generic device that will
simulate a variety of anti-armor weapon systems, (c) the Air Ground
Engagement System/Air Defense (AGES/ADII), and (d) the Automatic Weapons
Effects Signature Simulator (AWESS), which is a training device to simulate
the firing signature of the Army's caliber .50 and 7.62 vehicle-mounted
machine guns and 25mm Automatic Cannon.

In FY 84, various Project efforts under this Program Element include: (a)
development of prototype models of the Crew Group Trainer, (b) design and
development of prototypes on a subcaliber training device for the 25mm
Automatic Cannon on the Bradley Fighting Vehicle, (c) engineering development
on the AGES/ADII, and (d) development of a prototype for AWESS.

In FY 85, work planned for various Project efforts under this Program Element
include: (a) development of interface devices to allow Multiple Integrated
Laser Engagement System (MILES) equipped direct fire weapon systems to be
interoperable with RETS, (b) continued engineering development of AGES/ADII

to include design and fabrication of prototypes, and (c) continued design and development efforts for the Signal Intelligence/Electronic Warfare operator trainer and AWESS.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include engineering development efforts for a variety of training devices and battle simulation systems which will provide realistic, effective, and economical training in marksmanship, gunnery, air defense, and nuclear, biological, and chemical (NBC) warfare.

FUTURE DIRECTIONS:

Future directions for this Program Element are to continue providing engineering development of NSTD.

PROJECT OVERVIEW

	84	85
PROJECT: D237 NON-SYSTEM TRAINING DEVICES - ARTILLERY/AIR DEFENSE/ENGINEER	$ 1.1M	$14.6M

PE: 64715A   NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to improve the effectiveness and efficiency
of Army training by developing training devices which facilitate the transfer
of the knowledge, ability, and experience required for trainees to fight
outnumbered and win on the modern battlefield. It supports the engineering
development of Artillery/Air Defense/Engineer related Non-System Training
Devices (NSTD).

In FY 84, it is planned to conduct engineering development of the Air Ground
Engagement System/Air Defense (AGES/ADII) to provide Multiple Integrated
Laser Engagement (MILES) capability for the AH-64, UH-60, CH-47, and SGT York.

In FY 85, work will continue on engineering development of the AGES/ADII
engagement system to include design and fabrication of AGES/ADII prototypes.
Engineering development will be conducted on the Firing Battery Trainer (FBT)
for field artillery crews to practice firing without the expenditure of
service ammunition. An interface device that incorporates the output of the
FBT into the Training Set Fire Observation and the Fire Direction Centers
will be developed so that the total battalion-level field artillery can
exercise the command and control procedures and execute fire orders without
using full caliber service ammunition. It is also planned to conduct
engineering development of the Air Defense Tactical System Simulator (ADTSS)
which will be a computer-driven simulator (integrating Hawk, Patriot, and
AN/TSQ-73 training of the missile coordination center, group operations
center, battalion operation center, and battery) which substitutes for live
missiles and aircraft targets. Engineering development will be conducted for
the Air Battle Management Training Simulator (ABMTS) for entry and refresher
level training of air defense officers in realistic theater oriented air
defense doctrine. The FY 85 program plans for the FBT, ADTSS, and ABMTS
include award of the development contracts, establishing the system design
for each item and initiating fabrication of prototype systems for test. In
addition, development of integrated logistics support packages and production
engineering planning will be initiated.

PAYOFF/UTILIZATION:

The payoffs for this Project include: (a) enhanced training effectiveness,
and (b) minimized requirements for scarce resources.

In FY 83, engineering development was completed on a weapons effects
signature simulator for use on aircraft equipped with the laser engagement
exercise training device (the Air Ground Engagement System) to avoid the need
for the use of blank training ammunition for 20mm automatic cannons during
combined arms tactical engagement simulation field training exercises.

PROJECT OVERVIEW

		84	85
PROJECT: D239	NON-SYSTEM TRAINING DEVICES - INFANTRY	$ 0.0M	$ 1.0M
PE: 64715A	NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	PROJECT MANAGER FOR TRAINING DEVICES		

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PROJECT SYNOPSIS.

The objective of this Project is to develop prototype training devices to support infantry training within the Army.

The FY 85 program will conduct development of interface devices to allow Multiple Integrated Laser Engagement System (MILES) equipped direct fire weapon systems to be interoperable with the Remote Target System (RETS) so that portions of marksmanship and gunnery training can be conducted with lasers. This device is called MILES-RETS.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) support of infantry training within the Army through the development of prototype training devices, and (b) specific to the RETS, more effective training within environmental and real estate constraints along with a realistic threat scenario that allows a high transfer of training value to a combat situation.

In FY 83, development was completed on the RETS. This device provides an integrated solution to the small arms marksmanship target needs of infantry troops as well as tank gunnery target needs of armor troops. It provides reliable target mechanisms which will be used in a stationary position or as a moving target. The moving target provides the flexibility of selectable speeds, and the target bobs and weaves from side to side as it moves down the track. The computerized operator console provides a status display of all target mechanisms down range. The console identifies any malfunctioning which may occur down range. The console is controlled manually or automatically by a computerized scenario tape. A manual override capability also exists. The console provides for a printout after each firing scenario. The printout provides a place for the firer's name and his score, lists all target exposures, and indicates the number of hits on each target exposed.

PROJECT OVERVIEW

		84	85
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PROJECT: D241	NON-SYSTEM TRAINING DEVICES - COMBINED ARMS	$ 5.1M	$11.4M

PE: 64715A   NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to support development of combined arms-related Non-System Training Devices.

In FY 84, efforts in this Project will include design and initiation of development prototypes for: (a) The Automatic Weapons Effects Signature Simulator (AWESS), which is a training device to simulate the firing signature of the Army's full family of machine guns (caliber .50 and 7.62mm), the 20mm machine cannon, and the 25mm automatic cannon (the devices will be used in lieu of blank ammunition to simulate the visual and aural effects of weapons firing during both conventional and engagement simulation field exercises), and (b) the Signal Intelligence/Electronic Warfare (SIGINT/EW) operator trainer. The operator trainer will simulate and integrate the operational characteristics of numerous intelligence hardware systems.

In FY 85, it is planned to continue the design and development efforts for the SIGINT/EW operator trainer and AWESS for the caliber 50 and 7.62mm vehicle mounted machine guns. Engineering development will be initiated on the design of the Signal Intelligence/Electronic Warfare Institutional maintenance trainer (which will provide fault isolation and maintenance training for complex computer-based equipment), and on the design of the computer-assisted simulation trainer for Medical Corps personnel. The trainer will teach command and staff techniques used in managing hospital resources in the Communications Zone and the Corps rear area of a Theater of Operations.

PAYOFF/UTILIZATION:

The payoffs for this Project include: (a) reduced training costs by using simulators instead of actual equipment, and (b) safer training conditions, while still providing high transfer of training to combat situations.

A specific payoff for AWESS is that it greatly reduces training costs by eliminating the need for expensive blank ammunition. For example, the projected expenditure of .50 caliber blank ammunition to support Multiple Integrated Laser Engagement System (MILES) exercises during 1983 was 60 million rounds. The estimated cost of the blank ammunition in 1979 dollars was $30 million.

In FY 83, this Project funded the development of two simulation systems: (a) the Army Training Battle Simulation System (ARTBASS), and (b) the Alpha Radiac Training Device of the AN/PDR-56 Radiacmeter. The payoffs of the ARTBASS include: (a) improved training exercises for leaders and staff because ARTBASS is designed to permit battalion command groups to exercise, refine, and upgrade their staff procedures and decision making processes while relieving the commanders of the unit to perform their own roles during

the exercise, and (b) reduced preparation time since the number of players and controllers and the amount of time to orient them is minimized.

The payoff of the RADIAC is that it will allow teams to practice Alpha Radiation monitoring and survey techniques without being exposed to hazardous radiation. With the exception of the Nuclear Weapons Training Detachment at Kirkland Air Force Base, New Mexico, no installation is currently available for field training with actual equipment using a radioactive source. This simulator is identical in appearance and operation to actual radiation monitoring and survey equipment.

PROJECT OVERVIEW

	84	85
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PROJECT: D572 NON-SYSTEM TRAINING DEVICES - ARMOR/ANTI-ARMOR	$ 2.8M	$ 1.5M

PROJECT: D572   NON-SYSTEM TRAINING $ 2.8M $ 1.5M
                             DEVICES -
                             ARMOR/ANTI-ARMOR

PE: 64715A   NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

RESPONSIBLE ORGANIZATION: PROJECT MANAGER FOR TRAINING DEVICES

PROJECT SYNOPSIS:

The objective of this Project is to develop prototype training devices to support armor/anti-armor training within the Army.

In FY 84, this Project funds the development of prototype models of the Crew Group Trainer, which is a generic device that simulates a variety of anti-armor weapon systems. The application of the Crew Group Trainer for training DRAGON missile gunnery will undergo development, and operational testing and development of this application will be completed. Also, design and development of prototypes will be initiated on a subcaliber training device for the 25mm Automatic Cannon on the Bradley Fighting Vehicle.

In FY 85, the application of the Crew Group Trainer for training the Tube-launched Optically-tracked Wireguided Missile System (TOW) gunnery will undergo development and operational testing, and the TOW application of the Crew Group Trainer development will be completed. The subcaliber training device for the 25mm Automatic Cannon on the Bradley Fighting Vehicle will undergo development and operational testing, and development will be completed. Also, design and development of prototypes will be initiated on the Full Armor Crew Training Simulator (FACTS) for the M60A3 and M1 tanks. The FACTS will provide full crew integrated tank gunnery training using laser reactive targets, videodisk-based gunnery task trainers, a diagnostic dry fire feedback and recording system, loader trainers, and a target engagement simulator.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) improved combat effectiveness by providing realistic training scenarios through the use of simulators, and (b) increased training effectiveness without increased expenditures of main tank gun ammunition through the use of FACTS.

In FY 83, a below-threshold reprogramming of the funds in this Project into Project D239 completed the integration efforts to combine the Armor Remote Target System into the Remote Target System under Project D239.

PROJECT OVERVIEW

		84	85
PROJECT: D573	PMTRADE AND NTEC SUPPORT	$ 3.6M	$ 6.0M
PE: 64715A	NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	PROJECT MANAGER FOR TRAINING DEVICES		

PROJECT SYNOPSIS:

The objective of this Project is to fund the support of Project Manager for Training Devices (PMTRADE) personnel and to fund a proportionate Army share of the operating costs of the Naval Training Equipment Center (NTEC).

This Project provides the Army with a unique and specialized capability in all phases of Research and Development of cost-effective simulators for use as training devices to assure safe, economical, and effective training in establishing and maintaining the highest attainable degree of operational readiness. This arrangement is the result of an Inter-Service Support Agreement that is reviewed annually.

PAYOFF/UTILIZATION:

The payoff of this Project is that this arrangement makes available all NTEC resources for Army use.

These resources include: (a) over 800 civilian employees, of which almost 40 percent are professional personnel specializing in research, development, and training technology, and (b) extensive simulation facilities, including laboratories in areas such as physical sciences, electronics, visual simulation, computers, and human factors. Thus, the PMTRADE located at NTEC, with a limited number of Army personnel, performs a mission for the Army in the training area similar to those of development commands in other areas. Also, it includes contractual services for support which NTEC cannot provide due to manpower constraints.

PROGRAM ELEMENT OVERVIEW

PE: 64722A   EDUCATION AND TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: ARMY

FUNDING: FY84 $ 6.0M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 7.7M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to respond to FY 83 and FY 84
Congressional and DoD requirements to demonstrate the joint-Service
effectiveness of advanced technology in education and training.

Report 97-943 of the House Appropriations Bill states the Committee's wish to
establish this program as an item of special interest (along with PE 64709N)
in the area of training and education and reprogram funds for this
technology. This tri-Service engineering development program responds to that
request and demonstrates prototype training methods and devices that will
ensure that military personnel can perform their jobs, such as equipment
maintenance, in a proficient manner. During the next decade, the increasing
density and sophistication of new equipment and the decreasing supply of
people will require new, more effective methods to ensure the effectiveness
of military job performance. The 1981 Defense Science Board (DSB) Summer
Study on the Technology Base concluded that microprocessor-based personal
learning aids represent one of the 17 technologies that can make an
order-of-magnitude difference in combat effectiveness. This theme was further
emphasized by the 1982 DSB Summer Study on Training and Training Technology,
which recommended increased investment in R&D on computer-based instruction,
simulation, and training in units.

Using earlier funding from Program Element 64709N, three technology-based
instructional methods that can be used by more than one Service were
identified: a Portable Electronic Aid for Maintenance (PEAM), a multi-purpose,
tri-service instructional application delivery system (TRIADS), and a
hand-held tutor.

In FY 85, user testing of PEAM will be completed and it will be transitioned
to operational status.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved skill levels of
maintenance personnel, (b) reduced burden for Service training, and (c)
reduced training costs.

The demonstration of advanced training methods, simulators and training
devices employing state-of-the-art information technology reduces the heavy
personnel burden currently required for Service training. PEAM is an
outstanding example of the value of collaborative research and development.
Service experience has been that only 23 percent of maintenance tasks are
performed correctly, only 33 percent of technicians performing final checks
do them correctly, and that 40 percent of parts that are removed as defective
are, in fact, not defective. A maintenance aid such as PEAM can be expected
to reduce errors by up to 20 percent. Initial targeted applications are
programmed for the Army's M1 Abrams Tank, the Navy's Trident Submarine, and
the Air Force's B-1 Bomber.

Additionally, implementation of developments from this Program Element by two or more Services can lead to significant cost savings through elimination of parallel developments and an economy of scale through tri-Service procurement of the relevant hardware and software support. This tri-Service program is one of two Program Elements aimed at demonstrating maturing technology-based programs. Duplication of effort is avoided by Technology Base Reviews and DoD Apportionment Reviews. Research Coordination is assured through a joint-Service Steering Committee that monitors the activities and selects promising engineering development demonstrations to be pursued. Memoranda of Understanding between the Army Research Institute and other organizations also helps to coordinate the program.

FUTURE DIRECTIONS:

Program funds will develop military prototype hardware and software to meet present training deficiencies or projected future needs. A steering committee chaired by a representative of the Office of the Under Secretary of Defense/Research & Engineering and comprised of representatives from each Service will decide which developmental efforts to fund. Possible candidates for engineering development include: technology based personal learning aids, low-cost job-site training systems, suitcase trainers, electronic war games, improved visual displays for simulators, improved weapon fire simulation techniques, computer-based job-site training management systems and feedback systems for instructional quality control.

PROJECT OVERVIEW

		84	85
PROJECT: D750	EDUCATION AND TRAINING SYSTEM	$ 6.0M	$ 7.7M
PE: 64722A	EDUCATION AND TRAINING SYSTEMS		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	ARMY		
RESPONSIBLE ORGANIZATION:	ARMY RESEARCH INSTITUTE		

PROJECT SYNOPSIS:

The objective of this Project is to provide demonstrations of joint Army, Navy, and Air Force prototype, technology-based, training and job-aiding devices that will meet the Services' most pressing training problems.

The first two engineering developments undertaken in response to Congressional and Department of Defense direction have been the Portable Electronic Aid for Maintenance (PEAM) and a Tri-Service Instructional Application Delivery System (TRIADS). These efforts emphasize joint-Service use of common interface standards, display protocol, human interaction, and operating system conventions. Future tasks will focus on demonstration projects related to advanced training and instructional support systems for operators and maintainers.

The PEAM and TRIADS efforts, begun under Navy Tri-Service Program Element 64709N, will be continued in FY 84 under Project D750. The PEAM task comprises development of portable delivery systems for electronic presentation of maintenance information to military field technicians, and development of a supporting maintenance information authoring and management system. PEAM will minimize technical training requirements by providing better, more complete and more usable technical information at the actual location of maintenance performance. It will help circumvent technical reading programs through the use of speech synthesis/recognition and will improve combat readiness by providing specific, on-the-spot guidance for the individual technician. This will lead to increased equipment availability. In FY 84, PEAM will be subjected to user testing.

The TRIADS effort encompasses the integration of software and hardware for computer-based instruction separately developed by the Army, Navy, and Air Force. This will result in a capability for more efficient and effective production, delivery, and management of computer-based courseware and training materials for a variety of instructional/training objectives, usable by all the Services.

A third engineering development under this Project is a hand-held tutor. It will be applied to the following Service needs: (a) (Army) individual training in land navigation and the Army's Job Skills Education Program, (b) (Air Force) training for maintenance of various Space Shuttle components, (c) (Navy) use by the Marines for training in mathematics and various occupational specialties, and (D) (Department of Defense) evaluation by the Defense Language Institute for English-as-a-second-language training and extension to foreign language training.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) more effective training for units, (b) less reliance on institutional training, (c) reduced requirements for training support personnel, (d) more effective military job performance, and (e) more efficient and effective production, delivery, and management of computer-based courseware and training materials for a variety of instructional/training objectives, usable by all the Services.

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III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102A						DEFENSE RESEARCH SCIENCES
B74A	HEL	2.457	2.617	HF	4	HUMAN ENGINEERING
B74F-1	ARI	0.882	1.500	ET	6	PERSONNEL PERFORMANCE AND TRAINING
B74F-2	ARI	0.751	1.591	HF	4	PERSONNEL PERFORMANCE AND TRAINING
B74F-3	ARI	0.756	1.000	MP	2	PERSONNEL PERFORMANCE AND TRAINING
B74F-4	ARI	0.352	0.500	ST	4	PERSONNEL PERFORMANCE AND TRAINING
		------	------			
		5.198	7.208			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 61102A :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	5.198	7.208

(CONTINUED)

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

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              PERFORMING  FY84   FY85 CONG
PE/PROJECT    ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

62716A                                            HUMAN FACTORS ENGINEERING
                                                  SYSTEM DEVELOPMENT

  AH70        HEL         9.825 11.468  HF    4    HUMAN FACTORS ENGINEERING
                         ------ ------              SYSTEM DEVELOPMENT
                         9.825 11.468             TOTAL IN PE
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  TOTAL FUNDING IN PROGRAM ELEMENT 62716A :                FY84     FY85
                                                           ------   ------
              THE PRESIDENT'S BUDGET, JANUARY 1984         9.825    11.468
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(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62717A						HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
A790-1	ARI	1.551	1.910	HF	4	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
A790-2	ARI	2.326	2.866	ST	6	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
		3.877	4.776			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62717A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	3.877	4.776

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62722A						MANPOWER, PERSONNEL AND TRAINING
A791-1	ARI	2.950	3.561	MP	2	MANPOWER, PERSONNEL AND TRAINING
A791-2	ARI	3.606	4.352	ET	6	MANPOWER, PERSONNEL AND TRAINING
		6.556	7.913			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62722A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	6.556	7.913

(CONTINUED)

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62727A						NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY
A230	PMTRADE	3.365	4.528	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY
		------	------			
		3.365	4.528			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62727A :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	3.365	4.528

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63216A						SYNTHETIC FLIGHT SIMULATORS
DB34	AVRADCOM	5.125	3.285	ST	6	ROTOR SYSTEM INTEGRATION SIMULATOR (RSIS)
DB39	PMTRADE	6.976	5.808	ST	6G	FLIGHT SIMULATOR COMPONENTS
		-------	------			
		12.101	9.093			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63216A :		FY84	FY85
		------	------
THE PRESIDENT'S BUDGET, JANUARY 1984		12.101	9.093

(CONTINUED)

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
==						
63731A						MANPOWER AND PERSONNEL
A792-1	ARI	9.825	17.026	MP	2	MANPOWER AND PERSONNEL
		------	------			
		9.825	17.026			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63731A :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	9.825	17.026

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63738A						NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT
A224	PMTRADE	2.365	2.462	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARMOR/ANTI-ARMOR
A225	PMTRADE	0.000	3.638	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARTILLERY/AIR DEFENSE ENGINEER
		------	------			
		2.365	6.100			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63738A :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	2.365	6.100

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63739A						HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
A793	ARI	4.202	10.376	HF	4	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
		4.202	10.376			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63739A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	4.202	10.376

(CONTINUED)

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

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            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

63743A                                         EDUCATION AND TRAINING

 A794-1     ARI         7.575 11.661  ET    6     EDUCATION AND TRAINING
                        ------ ------
                        7.575 11.661           TOTAL IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 63743A :           FY84     FY85
                                                       ------   ------
               THE PRESIDENT'S BUDGET, JANUARY 1984    7.575    11.661

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(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

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             PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=======================================================================

63744A                                           TRAINING SIMULATION

A795        ARI         3.034  4.763  ST   6     TRAINING SIMULATION
                        ------ ------
                        3.034  4.763              TOTAL IN PE
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 TOTAL FUNDING IN PROGRAM ELEMENT 63744A :            FY84    FY85
                                                      ------  ------
              THE PRESIDENT'S BUDGET, JANUARY 1984    3.034   4.763
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(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

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             PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL   PE/PROJECT TITLES
===================================================================================

64217A                                            SYNTHETIC FLIGHT TRAINING
                                                  SYSTEMS

  D275       PMTRADE    12.719 14.134  ST    6     SYNTHETIC FLIGHT TRAINING
                                                   SYSTEMS
                       ------ ------
                       12.719 14.134          TOTAL IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 64217A :                FY84      FY85
                                                           ------    ------
                 THE PRESIDENT'S BUDGET, JANUARY 1984      12.719    14.134
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III-A-1: LISTING OF ARMY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715A						NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING
D237	PMTRADE	1.093	14.632	ST	6C	NON-SYSTEM TRAINING DEVICES - ARTILLERY/AIR DEFENSE/ENGINEER
D239	PMTRADE	0.000	0.985	ST	6C	NON-SYSTEM TRAINING DEVICES - INFANTRY
D241	PMTRADE	5.041	11.421	ST	6	NON-SYSTEM TRAINING DEVICES - COMBINED ARMS
D572	PMTRADE	2.840	1.477	ST	6	NON-SYSTEM TRAINING DEVICES - ARMOR/ANTI-ARMOR
D573	PMTRADE	3.571	6.015	ST	6B	PMTRADE AND NTEC SUPPORT
		12.545	34.530			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64715A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	12.545	34.530

(CONTINUATION)

III-A-1: LISTING OF ARMY PROJECTS

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              PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

64722A                                           EDUCATION AND TRAINING
                                                 SYSTEMS

  D750       ARI         6.000  7.740 ET    6    EDUCATION AND TRAINING
                                                 SYSTEM
                         ------ ------
                         6.000  7.740           TOTAL IN PE
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    TOTAL FUNDING IN PROGRAM ELEMENT 64722A :              FY84     FY85
                                                           ------   ------
                    THE PRESIDENT'S BUDGET, JANUARY 1984   6.000    7.740
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III.B. NAVY PROGRAM ELEMENT AND PROJECT SYNOPSES

Table III-B-1: Listing of Projects - Lists projects for each NAVY
program element. Lists contain performing organization, funding,
Congressional Category and goal information.

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PROGRAM ELEMENT OVERVIEW

PE: 61153N   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                              HUMAN FACTORS
                              MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 9.9M (FY85 PRESIDENT'S BUDGET)
                              FY85 $12.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to establish theories and methods
that enhance the ability to understand and predict human behavior through
research on human learning, memory, training, testing, equipment operation
and maintenance, and organizational commitment and productivity.

Research approaches include theoretical formulations, laboratory and
simulator experimentation, mathematical modeling, correlational analyses, and
observation and measurement in operational settings. Primary areas of
emphasis in training research include investigation of the acquisition of
complex skills and research on advanced computer-based instructional
techniques, usually involving artificial intelligence. In the testing area,
emphasis is on theories underlying the development and scoring of highly
diagnostic adaptive testing procedures for personnel selection and
classification. Engineering psychology research emphasizes the perceptual,
decision making and control performance of personnel in high-technology
systems, and the development of principles and guidelines to design equipment
for ease of operation and maintenance. In organizational effectiveness, the
primary emphasis is on individual and group performance and productivity,
adaptation to organizational stress, and research on heterogeneous work
forces.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) reduction in training time
and costs, (b) improvement in the diagnostic power of tests, (c) increases in
the operability, maintainability and readiness of man-machine systems, and
(d) maintenance of a highly qualified and committed work force. The research
findings support development of advanced training technology by the Navy
training community, development of operational man-machine systems by the
System Command and Headquarters Naval Material Command laboratories, and
development of manpower and personnel policies and practices which affect
recruitment, retention, and productivity.

Progress made in the areas of personnel and training research, organizational
effectiveness, and engineering psychology include: (a) a method based on
time-response theory for equating observed scores on different psychological
tests, (b) a software program based upon cognitive theory that can analyze,
on-line, the deep structure knowledge of students' computer programs and
infer each student's likely misconceptions, (c) quantification of the effects
of turnover in small groups on physiological indicators, social interactions,
and work output, and (d) a new metric of effective visual contrast that
combines data on chromatic and luminance discriminability, permitting
quantitative tradeoffs between luminance, chromaticity, and their effects on
visual task performance.

FUTURE DIRECTIONS:

Plans for FY 86 include: (a) research on model-based personnel measurement to extend the item-response approach to additional response scoring formats and multidimensional problem domains, (b) investigation of strategies used in interpreting visually presented technical material such as engineering drawings, (c) development of activation-based models of the role of attention in dual-task performance, (d) refinement and adaptation of student models to improve the on-line diagnosis of specific student misconceptions in intelligent computer-based instruction, (e) establishment of robust theoretical models relating organizational commitment and productivity to organizational practices and to social cognition (i.e., learning and representation of knowledge about organizations), (f) investigation of relationships between biological and organizational stress, (g) incorporation of cognitive science into a general theory of human interaction with intelligent systems, (h) research on decision making stressing explanatory theories and models of inference and choice, and (i) extending visual perception theories to include computational model concepts based on an information-processing theory of vision.

PROJECT OVERVIEW

	84	85
PROJECT: RRO4204 PERSONNEL UTILIZATION	$ 0.9M	$ 0.9M

PE: 81153N   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: OFFICE OF NAVAL RESEARCH

PROJECT SYNOPSIS:

The objective of this Project is to provide psychometric theories and
techniques to support improved individualized psychological measurement, to
determine the nature of individual differences in information-processing
capabilities, and to determine the implications of these differences for
real-world performance.

Precise and accurate tests are needed to prevent ill effects of test errors
on individuals and to provide accurate data for policy decisions. There is
also an increasing pressure to reduce the time and costs of testing. Another
broad objective focuses on techniques and concepts that can lead to better
measurement of personnel and improved prediction of both training
effectiveness and job performance.

Model-based measurement technology has the potential of enabling test
designers and users to increase the quantity and quality of the information
they get from tests, while simultaneously increasing test efficiency. With
improved measurement models, different examinees can respond to distinct sets
of test tasks so a test can be individually tailored. Also, measurement
models which anticipate certain regularities in the pattern of an
individual's performance on test problems will enable us to flag certain
response patterns as "unexpected," and thereby question the validity of
individual test scores.

The Project will also provide a coherent framework within which to model a
richer variety of aspects of task performance. Research on individual
differences in information-processing capabilities will form the basis for
real-time, process-oriented measurement tasks which tap capabilities crucial
to many Navy tasks but currently not assessed by conventional testing
technology.

Work on model-based measurement is developing a sophisticated latent-trait
theory. The work of a latent-trait theory is done by response operating
characteristics. These mathematical functions describe the relationship
between an examinee's capabilities and the probability of his potential
response to test problems. Research on the specification, estimation,
validation, and application of response operating characteristics for
increasing complex task domains, response formats, and response aspects are
the central problems being addressed by this Project.

Research on individual differences in information processing is concerned
with the time-course discrepancies among individuals in their ability to
construct, maintain, and manipulate mental data. Laboratory tasks are devised,
along with an accompanying model, in order to isolate the parameters of
interest. Parameter estimates based on performance data are used to relate an
individual's performance on a basic, information-processing task to
performance on increasingly complex everyday tasks of the types found in Navy

jobs.

A general class of abilities under investigation involves those required for spatial reasoning. These abilities are decomposed into a set of more primitive, information-processing operations, each with its own temporal characteristics, attentional demands, and controlling mechanisms. These operations can be studied independently of the demands of a reasoning task, or as part of that task. Individual differences in the employment and efficiency of these components are being related to overall task performance.

PAYOFF/UTILIZATION:

The payoff of this Project is to produce dramatic increases in the accuracy, efficiency, validity, and scope of personnel testing. Results can save time and money and improve predictions of success in schools and jobs. This Project is the primary source of support for the development of latent-trait theory and computerized adaptive testing. An item-response-theory method for equating scores on two tests has been developed and validated. This work also supports the tri-service effort to adaptively administer the Armed Services Vocational Aptitude Battery (ASVAB).

Techniques were developed to assess the sampling variance and statistical bias in item pools for trait-estimation procedures and competing equating techniques. A study was completed on effects of guessing on the dimensionality of multiple-choice tests. Techniques were developed to evaluate the appropriateness of an individual response pattern. These methods help detect examinees who may be deliberately failing a qualification test.

The research on information processing abilities provides a basis for designing psychometric instruments to predict real job performance rather than just school success. A new method was developed for studying intelligence in terms of information processing models and the method was applied to the study of reasoning with unfamiliar concepts and tasks. A strategy-shift model was developed which showed that people can vary their solution strategies in a complex spatial reasoning task to include non-spatial solution methods. Extended practice on spatial tasks was found to greatly improve test performance of low ability examinees. A componential theory of mental imagery was developed which identified the components needed to effectively use imagery to represent both direct, real-world phenomena and abstract relationships. Work was done to reconcile current knowledge on mental-resource allocation with knowledge about cerebral specialization of information processing, and research supported the theory that each hemisphere acts as an independent resource pool. Other work showed that individuals sometimes use a constructive strategy in which they seem to construct a three-dimensional mental representation of an object and at other times seem to solve problems analytically by means of a feature analysis.

The Project has transitioned the following efforts: (a) simultaneous regression in m-groups, (b) polychotomous scoring, (c) observed-score equating, (d) techniques for non-parametric estimation of response operating characteristics, and (d) on-line calibration.

PROJECT OVERVIEW

	84	85
PROJECT: RR04206	LEARNING AND TRAINING	$ 4.3M $ 6.3M
PE: 61153N	DEFENSE RESEARCH SCIENCES	
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING	
DoD ORGANIZATION:	NAVY	
RESPONSIBLE ORGANIZATION:	OFFICE OF NAVAL RESEARCH	

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) explain the nature of knowledge
representation and problem solving to incorporate specific knowledge
(instructional material) into intelligent computer-assisted instruction, and
(b) understand the effects of the structure and content of instructional
materials (text, films, computer presentations) on learning efficiency, and
use this knowledge to produce guidelines for instructional design.

The cognitive processes task area provides the scientific basis for modeling
the cognitive structures and processes that support highly skilled,
real-world problem solving and human information processing. A major
objective is a precise account of the processes involved in high levels of
planning and problem solving skills. A related goal is the development of
useful theories on the nature of human reasoning about complex systems. A
third objective is to determine, in detail, the nature of human information
processing in tasks requiring coordinated perception and action, such as map
reading, interpretation of text and diagrams, and comprehension of complex
systems.

A major objective of this research is to develop adequate theoretical tools
for analyzing the characteristics of particular instructional problems. These
precise tools include the following: (a) models and methods for formally
representing the knowledge that a person brings to the learning situation,
(b) ways of incorporating artificial intelligence (AI) into computer-assisted
instruction to make the instruction more flexible, interactive and effective,
(c) experimental methods for modeling the learning and instructional
processes by which knowledge is updated, reorganized, understood and used,
(d) precise, often computer-assisted methods for specifying the semantic and
syntactic structure of instructional text, and (e) extension of these methods
to the analysis of the semantic (deep level) information in pictures,
graphics and movies.

This Project is coordinated among the Office of Naval Research (ONR), the
National Institute of Education (NIE) (research on basic skills) and the
National Science Foundation (NSF) (research on math and science instruction).
This Project includes contracts in the area of intelligent computer-assisted
instruction that are funded jointly between the ONR and the Army Research
Institute for the Behavioral and Social Sciences (ARI).

This Project includes three special focus basic research programs. The
Learning and Memory program is a multidisciplinary effort to extend and
consolidate recent important developments in the neural, psychological, and
mathematical sciences into a unified theory of learning, memory, and self
organization in the central nervous system. The primary objective of the work
is a theory of the neural mechanisms of learning and memory. The effort will
include studies of: (a) biochemical changes in neuronal physiology, (b)
single-neuron electrical activity, (c) neural pathways and functions, and (d)

models of neural structures as information-processing devices. This program
seeks a unified scientific view of learning and memory that will: (a) provide
a precise mathematical account of how neural tissue stores, represents and
retrieves information, (b) determine the basis of skilled behavior in terms
of activity in neural networks, (c) describe the functional changes in
neurons and synapses that accompany learning, and (d) relate these functional
changes to both local and global biochemical factors that operate during
learning.

The Cognitive and Technical Approaches to Navy Training program seeks to
produce cognitive theories, models, and training methods, and to develop
techniques for an integrated program to dramatically improve Navy training.
Scheduled to start in FY 85, this program is part of the Navy Training
Improvement Program (NAVTIP). Objectives are to: (a) formulate componential
models of reading and mathematical skills and develop training regimes based
on these models, (b) determine how the cognitive, social, and motivational
aspects of different training environments and delivery systems affect
training effectiveness, and (c) determine principles of automated tutoring
and formulate theories of human understanding of complex systems and
situations to be used in conceptual simulations for technical and tactical
training.

Research on basic skills will seek models of skill deficiencies and will
derive remediation methods. Research on reading will extend current
activation-based models of low-level text processing to account for higher,
discourse levels and will validate these models via componential assessment
and training experiments. The role of cooperative social units in training
environments will be studied, as well as the instructional aspects of gaming
and changes in patterns of information transfer that accompany the
introduction of training technology. Dialogue theory will be extended to
characterize student-computer interfaces at a conceptual level. Research on
complex skills will provide the scientific basis for reactive learning
environments which include abstract, conceptual simulations and automated
tutoring facilities. Principles of conceptual simulation will be derived by
developing formal, computational theories of how experts reason about complex
systems and situations, and training studies using concrete representations
of the abstract entities used in such reasoning. Research on automated
tutoring will develop techniques for interactive diagnosis of cognitive
deficiencies and rule-based approaches to interactive teaching. These
techniques will be validated in computer-simulation and empirical studies of
learning.

The Cognitive Processes special focus program provides the scientific basis
for modeling the cognitive structures and processes that support highly
skilled, real-world problem solving and human information processing.
Objectives of this program are to: (a) develop improved theories of problem
solving, (b) determine how people reason about complex systems, (c) determine
how people understand and use instructions and technical documentation, and
(d) develop theories of perception and action skills. Research on problem
solving is building an empirical base through detailed observation of
performance in various domains (e.g., electronics, computer programming,
contour-map interpretation) and ancillary techniques such as memory
experiments in the same domains.

PAYOFF/UTILIZATION:

The payoff of this Project will be the solution of many training problems in
the Navy through the introduction of more individualized, automated, and
simulator-based instruction.

The theoretical work on the nature of knowledge representation and on
optimizing the design of instructional materials is needed to advance the

state-of-the-art in computer-assisted instruction, to guide the use of more conventional technology, and to improve training efficiency. Identification of information-processing activities will help the Navy and Marine Corps deal more effectively with an increasingly varied recruit population which will be trained with a variety of conventional and unconventional training methods. Results of investigating the instructional aspects of advanced automated-training systems should provide instructional theories for the best use of computer-based flight simulators, methods for designing general problem-solving environments, training methods for remedying deficiencies in basic skills, and innovative ways to teach skills such as computer programming.

As part of a jointly-funded program between ONR and ARI to develop theory and techniques for the design of intelligent computer-assisted instruction (ICAI), a computer program understanding system was designed which can analyze, online, the deep-structure knowledge of students' computer programs and infer each student's likely misconceptions. Also, three different kinds of knowledge representations characterizing expert performance were identified.

PROJECT OVERVIEW

		84	85
PROJECT: RR04208	ORGANIZATIONAL EFFECTIVENESS	$ 1.9M	$ 2.2M
PE: 61153N	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	MANPOWER & PERSONNEL		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	OFFICE OF NAVAL RESEARCH		

PROJECT SYNOPSIS:

The objective of this Project is to increase understanding of the psychological and organizational variables that determine the performance of individuals, groups, teams, and units in the Navy and Marine Corps.

The Navy and Marine Corps need to continue improving the quality of personnel recruited, reduce unwanted personnel attrition, reduce losses of Petty Officers in shortage categories, and enhance the effectiveness of military and civilian employees. Achieving such goals requires more knowledge about the way people respond to persuasive communications, different organizational structures, management policies, incentives, career opportunities, the quality of working life, and leadership behavior. This research provides the scientific base for programs dealing with personnel attrition and retention, human resources management, recruitment, adaptation to organizational requirements, unit effectivenesss, and successful leadership of different kinds of work groups. The approach will include laboratory and field experiments plus research to devise improved theories and conceptual frameworks for increased understanding of morale, personnel turnover and retention, intergroup relations, and organizational adaptation.

In FY 84, this Project will: (a) produce theoretical statements of the major individual and group influences on the effectiveness of high-technology organizations, (b) analyze relationships between high school students' behavior and attitudes and their later performance on the job, and develop a theoretical framework covering such relationships, (c) begin research on factors that influence the effectiveness of human resource management units in an organization, (d) investigate how civilian and military employers locate and train talented minorities and women for high-technology positions and the impacts on organizational effectiveness of such efforts, and (e) begin research on the impacts on productivity, satisfaction, personnel turnover, and the experimental use of cooperative learning procedures with heterogeneous teams in high-technology organizations.

In FY 85, this project will: (a) produce novel research techniques for assessing the impact of job changes on the worker and on the organization, (b) identify the variables that determine organizational success in creating and exploiting new products and techniques, (c) produce a theoretical framework for analyzing the impact of the family on job behavior, (d) create and test theories on the ways that social psychological and cognitive variables affect the assessment of job performance, and (e) determine the relative effectiveness of different methodological approaches in assessing the motivation, attitudes, values and career progression of minority personnel.

PAYOFF/UTILIZATION:

The payoffs of this Project include improved quality of Navy and Marine Corps
personnel, reduction of personnel attrition and losses of Petty Officers in
shortage categories, and enhanced effectiveness of military and civilian
employees.

Toward these payoffs, the Project has specifically: (a) produced a new model
of employee decision making regarding staying in or leaving an organization,
(b) assembled the largest existing data base on electronics and aerospace
firms in the U.S. and Japan, (c) created a leader observation system which
reliably measures overt behavior, (d) completed research on goal setting
which specifies its relation to productivity, (e) determined the degree of
correlation between social support in the workplace and time lost due to
illness, (f) completed testing a model for predicting the effects of
stressors on task performance, (g) continued research on organizational
factors that facilitate or impede the use of basic behavioral research, (h)
collected data on patterns of socialization to work in high schools, (i)
began research on fundamental cognitive processes involved in making
performance ratings, and (j) completed an extensive series of experiments on
effects of turnover in small work groups on physiological indicators, social
interaction, and work output.

In addition, the Project has successfully transitioned the following into
exploratory development: (a) improved recruitment of Hispanics, (b) family
factors in Navy personnel retention, (c) personnel transfers, (d)
self-supervising techniques for Navy ASW teams, (e) coping aids for Marine
drill instructors, and (f) "Project Upgrade" analyses.

PROJECT OVERVIEW

		84	85

PROJECT: RRO4209   ENGINEERING PSYCHOLOGY $ 2.5M $ 2.8M

PE: 61153N   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: OFFICE OF NAVAL RESEARCH

PROJECT SYNOPSIS:

The objective of this Project is to enhance man-machine system operation, use, and maintenance through increased knowledge about relationships between human performance and the technological environment characteristics of Navy and Marine Corps operations.

Principal tasks include: (a) the derivation of models and theories that define human perceptual, psychomotor, and decision performance under relevant conditions, and (b) the formulation of human factors engineering principles and guidelines for the design of the interface between operators/maintainers and their machine controls, displays, workplaces, and environments.

Navy and Marine Corps personnel operate and maintain complex, high performance vehicles, weapon systems, and command/control (C2) systems in carrying out Navy missions undersea, on the ocean surface, and in the air. Several of these systems are characterized by complex man-machine interfaces and often impose human performance requirements in terms of rapid response times, high rates of information processing, and complex decision making that tax the capabilities of operational personnel. The extensive maintenance requirements of current shipboard and aviation systems, due in part to insufficient design standards for maintainability, place very high demands on maintenance technicians and adversely affect combat readiness. Furthermore, newer and higher performance systems, which will employ advanced technologies, are expected to place even more demands upon Naval personnel in the future. Effective system operation and operational readiness will depend upon matching the design of new equipment and work environments with the abilities and characteristics of the human operator/maintainer.

This Project uses logical and mathematical model building, laboratory simulations, and field tests to analyze, measure, evaluate, and integrate human performance data into forms that are useful to system designers.

In FY 84, this Project will: (a) investigate decision behavior with emphasis on broadening its scope to encompass creative human contributions to situation diagnosis, problem formulation and structuring, (b) initiate multi-disciplinary research on the dynamics of multi-person decision making under a range of organizational structures and doctrinal procedures. (this work is expected to provide foundations for design of Navy C2 systems which stress flexibility and decentralization), (c) continue to explore the visual processes which bear on the interpretation of imagery-based and multi-dimensional displays, (d) investigate the dynamic interaction and dialogue between the human operator and the image processing algorithms, and (e) develop and test software design methods which ease inter-designer communication and improve design of software tools.

In FY 85, this Project will: (a) investigate issues of cooperative decision making by spatially distributed teams, (b) develop models from which

predictions can be made and experimentally tested, (c) initiate basic
theoretical work to incorporate concepts of cognitive science (scripts,
frames, mental models) into a general theory of interface design for
optimizing human interaction with intelligent systems, and (d) extend current
theories of visual information processing to derive their relationships with
neurophysiological theories of visual processes.

The special focus program associated with this Project is titled Distributed
Tactical Decision Making. The purpose of this program is to develop
descriptive and quantitative models to represent human decision requirements,
networks, and protocols in distributed C2 systems such as the Composite
Warfare Command (CWC) organization. Models will be used as tools for
simulating/testing the consequences of variations in decision network and
protocol designs for information processing, transfer, and presentation
systems. A key element of the program will be the formulation of measures of
decision making effectiveness which are meaningful in the context of C2
systems.

Special focus objectives derive from the conditions of the CWC C2 environment,
i.e., multiple and physically separated decision nodes which are each
responsible for a subset of the overall problem space, resources, and
information, and which must cooperate in the reconfiguration of resource
control according to changing tactical conditions (e.g., threat types and
loads, resource losses, jammed channels). In this context, research on
distributed tactical decision making will pursue the following objectives:
(a) to determine, by descriptive and analytic modeling, a decision network
configuration compatible with CWC organization C2 systems, the
characteristics of decision requirements at various nodes in the network,
protocols by which decision situations will be recognized and resolved, and
the information support required by representative decision nodes, (b) to
determine, by experimentation, the characteristics of information
presentation (voice, data, graphics, pictures, summaries, etc.) which
optimize human decision making representative of different levels in the
decision network, (c) to determine, by experimentation, methods for
effectively embedding decision aids into the computational or display support
systems so as to increase decision speed and quality without increasing the
decision maker's workload, and (d) to determine, by model exercise, the
quantitative demands placed on computation, communication facilities and
protocols in supporting decision network, protocol, and presentation
alternatives.

The approach will include descriptive modeling using interview, observation,
and analysis of exercise data, mathematical representations of descriptive
models, a limited amount of experimentation and some man-in-the-loop
simulation. Various theoretical bases will be reviewed for potential
application to distributed team decision making with partially overlapping
information. New theoretical constructs will be developed for this general
case of cooperative negotiation for asset control. Exercise analyses and
observations, modeling, and laboratory experiments will be conducted by
private and university-based researchers. Simulation experiments will be
conducted at Navy labs, e.g., the Naval Oceans System Center (NOSC), the
Naval Air Development Center (NADC), and the Naval Underwater System Center
(NUSC).

PAYOFF/UTILIZATION:

The payoff of this Project will be improved human performance in high
technology systems to meet Navy and Marine Corps operational requirements.

Specifically, this Project has: (a) provided an understanding of the
perceptual structure of sounds (it has produced a basis for new approaches to
aid the sonar operator in target classification and a basis for new

techniques to improve ship silencing), (b) produced a new metric of effective
contrast that combines chromatic contrast with luminance contrast (this
metric of color discriminability enables quantitative trade-offs between
luminance, chrominance, and their effects on visual task performance), (c)
verified a multiple resource model of information processing which provides
new understanding concerning the effective use of display coding methods and
information processing appropriate to visual and auditory modalities, (d)
progressed toward an explanatory theory of diagnostic inference which
includes constructs such as cues to causality, nature of alternative
explanations, and sensitivity to disconfirming evidence, and (e) formulated a
representation of the process by which alternative diagnostic inferences are
evaluated.

In addition, this Project transitioned the following to exploratory
development: (a) auditory fault detection techniques for localization of
malfunctions in power plants, (b) perceptual factors in procedures for ship
silencing, (c) decision aiding techniques and models of human decision
performance, and (d) models of supervisory control for failure detection in
power plant control rooms.

PROJECT OVERVIEW

		84	85
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PROJECT: WR04210	HUMAN FACTORS ENGINEERING	$ 0.3M	$ 0.3M
PE: 61153N	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL AIR SYSTEMS COMMAND		

PROJECT SYNOPSIS:

The objectives of this Project are to develop a systems-oriented human
performance data base, to develop methods to define human capabilities in
complex task situations, and to define interface requirements for aviation
systems and missions.

Specific objectives include: (a) develop a tasking and measurement system for
deriving an aviation-relevant, realistic, multitask performance data base,
(b) develop techniques to define and quantify operator workload capabilities
and limitations in terms of system demands, (c) develop procedures for
verifying the applicability of theoretical research data to the multitask
aviation environment, and (d) derive a research vehicle for evaluating
innovative operator-machine interfaces in realistic aviation tasking contexts.

A major focus of effort is to synthesize existing knowledge on human operator
capabilities and limitations (such as sensory, perceptual, cognitive, and
motor performance characteristics) in complex operational task environments,
and expand these information bases with performance assessments in task
situations relevant to emerging aviation weapons system design problems.
Without such data, design criteria that reflect human capability to operate
and maintain naval systems will not be available to hardware designers during
the conceptualization, design, and development of systems, nor will methods
be available to realistically assess the human contribution to systems
effectiveness during test and evaluation.

The technical approach comprises three primary, sequentially executed
thrusts. First, identify candidate mission profiles (e.g., anti-submarine
warfare (ASW)) where human cognitive, information processing limitations
represent primary bottlenecks in system/mission effectiveness. These profiles
are chosen on the basis of: (a) their significance to air warfare
survivability, (b) the availability or producibility of documentation
regarding operator functioning and pertinent mission requirements, (c) the
availability of appropriate laboratory test environments where levels of
fidelity to actual mission requirements may be manipulated, (d) the potential
for addressing significant "technology pull" issues, (e) the lack of usable,
mission-related human performance data, and (f) strong prospects for the
generalization of findings to similar environments.

Second, identify finite sets of cognitive operations or processes which are
basic to the execution of the nearly infinite array of tasks actually
performed in the mission environment selected for study. This entails: (a)
the extensive examination of multitask, operator functioning to generate a
comprehensive taxonomy of single tasks which represent operationally-required
tasks, (b) testing student aviators for speed and accuracy on these single
response tasks, and (c) applying newly-developed hierarchical, factor
analytic techniques to the data to identify the finite constellation of
subservient basic processes (e.g., mental rotation of objects, etc.).

Third, Based on the results of the correlational analyses and extending from an additive to an interactive conceptualization, a heuristic, process-based model of the operator (OPMAN) will be developed. The model exploits theoretical conceptualizations (e.g., multiple resource theory) which are currently known to be successful in accounting for human cognitive functioning in laboratory settings. The experimental validation of the model is an iterative process. It entails (a) the generation of specific predictions of complex performance capabilities where attention allocation, and memory variables, etc., are factorially manipulated, and (b) testing for accuracy of the model in environments where mission fidelity is systematically increased.

The Project goals and progress are coordinated with representatives of the Naval Air Development Center and the Naval Training Equipment Center to ensure operational relevance of efforts in relation to current system design and training problems. Ongoing efforts are coordinated with the Office of Naval Research to ensure the technical adequacy of the program. Liaison with university investigators is maintained for technology exchange in related areas of investigation. Technology transfer is accomplished by participation in the DoD Technology Advisory Group for Human Factors Engineering.

PAYOFF/UTILIZATION:

The payoffs of this Project include near-term, mid-term, and long-term products. Near-term products, which respond to specific problems identified by ongoing exploratory development efforts, include: improved descriptions of human information handling and decision-making capabilities and limitations for individual and team functions, performance criteria and methods for measuring and predicting task complexity, and the means to diagnose Fleet task overload problems.

Mid-term products, which respond to problems identified by technology applications, include: (a) performance-based design criteria and guidelines which are made available to design engineers early during aviation weapons systems development, (b) test beds to emulate and evaluate the utility of new technology building-blocks (software and hardware for C3 systems), (c) methods to realistically assess aircrew contributions to systems effectiveness available during test and evaluation, and (d) research vehicles to assess innovative human-machine interfaces in a realistic multitask environment.

A long-term product in response to anticipated problems is improved operator-interactive input/output terminals (e.g., intelligent systems and robotics) to enhance human-machine effectiveness in cockpit command centers and control stations.

The assessment system and data base will provide: (a) definitions of human abilities and limitations across broad categories of tasking and workload requirements, (b) a foundation for systematically derived, performance-based design criteria and guidelines, and (c) a research vehicle for evaluating innovative human-machine interfaces in realistic multitask environments.

PROGRAM ELEMENT OVERVIEW

PE: 62757N   HUMAN FACTORS AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS
                                SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: '   FY84 $ 7.3M (FY85 PRESIDENT'S BUDGET)
                                FY85 $ 8.0M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop technology in the areas
of human factors and simulation. This effort is needed because of these key
issues: (a) present automated information systems are inadequate in a
multiple-threat warfare environment, (b) successful operation of future
weapon systems depends on integrating the human operator and maintainer into
the weapon system, (c) cost, scarcity, and potential hazards of operational
equipment for training in real environments restrict effective training, (d)
an effective person-machine-mission relationship must be developed to assure
that the demands and environment created by the equipment are compatible with
the abilities and characteristics of the human operator and maintainer, and
(e) development of improved visual and weapons simulation capabilities and
individualized automated training techniques is needed to minimize the
expensive operational equipment used for training.

PAYOFF/UTILIZATION:

The payoffs of this Program Element are: (a) improved ability of decision
makers to understand information from various sensors using adaptive
interactive displays, (b) reduced human workload and skill required for
system operation and maintenance, thereby increasing system effectiveness,
safety, and reliability and decreasing life-cycle costs, (c) enhanced ability
of the man-machine system to integrate, evaluate, and respond to rapidly
changing information, (d) improved performance of complex systems by
increasing equipment compatibility with the ability and characteristics of
human operators and maintainers, (e) improved visual simulation techniques to
support the training of a greater number of visually demanding tasks, thereby
providing increased training effectiveness and lowered costs of training
devices, (f) sensor simulation with a capability to provide coordinated
displays of inputs from multi-spectral sensors, (g) improved instructional
use of simulation hardware and software, (h) enhanced training device
utilization through increased trainee and instructor acceptance, and (i)
increased utilization of the capabilities of small science and technology
based firms in DoD R&D.

FUTURE DIRECTIONS:

This Program Element will continue to develop technology in the areas of
human factors and simulation.

PROJECT OVERVIEW

	84	85
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PROJECT: F57-242   TACTICAL INFORMATION $ 0.0M $ 0.2M
                          CORRELATION

PE: 62757N   HUMAN FACTORS AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to support improvements in the ability of
decision makers to understand information from various sensors through the
use of adaptive interactive displays. Displays will include air, surface,
subsurface, and satellite systems.

In FY 85 it is planned to: (a) initiate an effort to examine the ability of
decision makers to understand information displayed by various pictorial and
alphanumeric methods, and (b) begin evaluation of alternate combinations of
multimedia presentations with respect to level of detail and format for
improving the effectiveness of decision makers.

PAYOFF/UTILIZATION:

The payoff of this program will be an improved ability of decision makers to
understand information displayed by various pictorial and alphanumeric
methods.

PROJECT OVERVIEW

		84	85
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PROJECT: F57-525	HUMAN FACTORS TECHNOLOGY	$ 3.3M	$ 3.7M
PE: 62757N	HUMAN FACTORS AND SIMULATION TECHNOLOGY		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL AIR DEVELOPMENT CENTER		

PROJECT SYNOPSIS:

The objectives of this Project are designed to: (a) develop design criteria
to reduce human workload and skill needed for system operation and
maintenance, (b) develop decision aids to enhance the ability of the
man-machine system to integrate, evaluate and respond to rapidly changing
information, and (c) improve the performance of complex systems by increasing
the compatibility of equipment with the ability and characteristics of human
operators and maintainers.

In FY 84 the program will: (a) evaluate P-3C aircraft applications and
payoffs of voice interactive technology through the transfer of manual tasks
to the less saturated vocal/auditory channels, (b) complete the evaluation of
differences in human performance when using traditional versus computer-aided
display systems for control of ship propulsion systems, (c) evaluate revised
guidelines for use of color in command and control displays, (d) identify
human factors issues with respect to flat panel and helmet-mounted displays,
(e) evaluate image enhancement techniques for targets detected by airborne
sensors, (f) evaluate performance effectiveness of decision aids for passive
sonar target tracking, (g) determine required modifications in procedures for
casualty control tests and maintenance performance aids for shipboard
propulsion plants, (h) determine requirements for an effective
hardware-software system to support the transfer of knowledge from experts in
mission planning and situation assessment, and (i) incorporate this knowledge
in computer data bases, using artificial intelligence techniques.

In FY 85 it is planned to: (a) develop display design guidelines for
optimizing target detection, tracking, and classification, (b) evaluate
adaptive, interactive person-computer display/control systems for shipboard
propulsion, (c) implement maintenance performance aids and concepts for
advanced man-machine interfaces in a test bed and evaluate effectiveness, (d)
integrate a decision making model into the Navy Ship Combat System Simulation
Model to support design and evaluation of advanced shipboard tactical and
combat direction systems, (e) determine feasibility of combining expert
systems and relational data bases to improve airborne information management
and control, (f) complete evaluation of E-2C aircraft applications and
payoffs of voice interactive technology, and (g) complete the development of
a computer-aided design guide to help engineers in the production of
demonstrably improved designs for maintenance.

PAYOFF/UTILIZATION:

The payoffs of this Project will include: (a) reduced human workload and
skill required for system operation and maintenance, thereby increasing
system effectiveness, safety and reliability and decreasing life-cycle costs,
(b) decision aids to enhance the ability of the man-machine system to
integrate, evaluate and respond to rapidly changing information, and (c)

improved performance of complex systems by increasing the compatibility of equipment with the ability and characteristics of human operators and maintainers.

PROJECT OVERVIEW

	84	85
PROJECT: F57-526	SIMULATION TECHNOLOGY	$ 3.7M $ 3.6M

PE: 62757N   HUMAN FACTORS AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to develop: (a) improved visual simulation
techniques to support the training of a greater number of visually demanding
tasks to increase training effectiveness and to lower training device costs,
(b) sensor simulation with coordinated displays of inputs from multi-spectral
sensors, (c) techniques which improve the instructional use of simulation
hardware and software, and (d) techniques to enhance training device
utilization through increased trainee and instructor acceptance.

In FY 84 the Project will: (a) identify simulator design features and
individual differences among trainees that may predispose a trainee to
experience simulator aftereffects, (b) develop new concepts to improve
training in Chemical/Biological/Radiological defense, (c) evaluate artificial
intelligence techniques potentially useful for transferring knowledge held by
subject matter experts into a data base which can be accessed by a training
device, (d) develop very high speed integrated circuit trainer chip set
specifications, (e) develop a low cost ASW gram training device, and (f)
evaluate a computer-based instruction training system using Basic Electricity
and Electronics School students.

In FY 85 it is planned to: (a) design specifications and begin a
demonstration of an instructor knowledge expert system, (b) evaluate very
high speed integrated circuit components for training devices, (c) measure
body/G-seat motion cueing forces for helicopter trainers, (d) develop an
image processing capability to supply videodisk-based imagery for Synthetic
Aperture Radar and Forward Looking Infrared sensors, (e) develop a common
ocean model for ASW simulation, and (f) develop postural disequilibrium tests
for potential correlation with aircrew personnel who are subject to simulator
aftereffects.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the determination of the best
methods of incorporating modern advanced instructional technology,
emphasizing system development using simulation rather than mere duplication
of operational equipment, (b) strengthened training device and simulation
technology to develop and sustain the skills of weapon system operators and
maintainers at the highest possible level of readiness, (c) new simulation
techniques for visual and sensor training environments and an increased
emphasis on modern computer technology which will provide the
hardware/software capability to train operators and maintainers for more
demanding roles imposed by new weapon systems, and (d) a joint focus on
engineering capability and on the interface of these methods with the trainee
and instructor to deliver training equipment with the most value for an
identified training need. Without the data and methods produced by this
Project, training systems will continue to provide too much or too little

training at unnecessarily elevated costs.

PROJECT OVERVIEW

		84	85
PROJECT: F57-701	SMALL BUSINESS	$ 0.4M	$ 0.4M

PE: 62757N   HUMAN FACTORS AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: OFFICE OF NAVAL RESEARCH

PROJECT SYNOPSIS:

The objective of this Project is to stimulate small science and
technology-based businesses to show what kinds of manpower and training
research and development services they can provide to the Department of
Defense. This Project is part of the DoD Small Business Advanced Technology
Program.

In FY 84 this program will: (a) begin to develop a personalized interactive
display and analysis system which will help submarine commanders organize and
evaluate displayed information for an attack planning task, and (b) begin to
develop a trainable graphic display assistant for the decision maker which
will permit the selection of a preferred format from a data base and which
will provide the capability of monitoring and detecting a set of events in a
dynamic data base.

PAYOFF/UTILIZATION:

The payoff of this Project is stimulation of small, science and
technology-based businesses to demonstrate their ability to provide useful
services to the Department of Defense.

PROGRAM ELEMENT OVERVIEW

PE: 62763N   PERSONNEL AND TRAINING TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                                    HUMAN FACTORS
                                    MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 5.7M (FY85 PRESIDENT'S BUDGET)
                                    FY85 $ 6.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to develop technology which will
provide the Navy and Marine Corps with the most cost-effective procedures for
the recruitment, education, and assignment of all civilian and military
personnel.

One of the major coordinating themes is productivity. The need for this
effort stems from the following key issues: (a) the cost of military manpower
exceeds 50 percent of the defense budget, (b) trained personnel are required
to operate increasingly complex fleet equipment, and (c) more efficient and
effective methods are needed for the recruiting, management and retention of
personnel. Emphasis will be placed on developing computer-aided and
computer-managed training programs, new personnel training techniques, and
improved methodologies for measuring and evaluating individual, team, and
unit training effectiveness. The overall emphasis is upon getting potentially
productive people into the Navy, retaining them, and providing the means for
them to realize and enhance their potential.

The changes in Project F63-521, Manpower and Personnel technology, reflect
the combining of F63-500, USMC Personnel Resources management, with F63-521
in order to provide for better management of the related technical efforts in
manpower and personnel technology.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) the development of effective
methods for the recruitment, management and motivation of personnel, (b)
procedures to reduce attrition and increase retention, (c) procedures and
criteria for more effective utilization of personnel, (d) improved techniques
to predict individual performance, (e) the development of computer-aided and
computer-managed training, (f) timely and efficient on-site training
techniques, (g) a methodology for evaluating training effectiveness through
measurement of individual, team, and unit performance, (h) improved methods
for training lower aptitude personnel and personnel with language and
mathematics skill deficiencies, and (i) using measures of electrical activity
in the brain to identify personnel with the special skills required for
successful completion of training for aviator and/or sonar operator duties.

FUTURE DIRECTIONS:

This program will continue to emphasize the development of technology in the
areas of manpower, personnel, training and education.

PROJECT OVERVIEW

		84	85

PROJECT: F63-521   MANPOWER AND PERSONNEL $ 4.0M $ 4.7M
                           TECHNOLOGY

PE: 62763N   PERSONNEL AND TRAINING TECHNOLOGY

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to develop: (a) effective methods for the
recruitment, management, and motivation of personnel, (b) procedures to
reduce attrition and increase retention, (c) procedures and criteria for
better utilization of personnel, and (d) improved techniques to predict
performance of Navy personnel.

In FY 84 the program will: (a) determine the effects of standards and sharing
of incentive amounts on productivity, (b) identify candidate information
processing tasks for use as aptitude measures, (c) determine the significant
dimensions of performance for a sample of Navy jobs, (d) initiate the
evaluation of fatigue and biological rhythmic variables on task performance,
(e) complete efforts on the recruitment of prior service personnel, (f)
complete efforts designed to reduce stress experienced by Marine Corps drill
instructors, (g) complete the evaluation of a pilot program to reduce the
attrition of women Marines, and (h) begin developing critical incident
methods for identifying first term enlistees as high performers.

In FY 85 it is planned to: (a) determine the effects of expected incentive
amount, performance aggregation, and performance/incentive period for an
incentive management system designed to increase productivity, (b) develop a
diagnostic program to uncover error patterns frequently made by examinees in
the Armed Services Vocational Aptitude Battery, (c) develop experimental
information processing task measures to evaluate their potential in aptitude
assessment, (d) determine patterns of bioelectric/biomagnetic activity which
are characteristic of effective performance, (e) develop computerized
decision aids for use in counseling and assigning officers to billets, (f)
complete field test of computerized adaptive tests to replace the current
test procedures to reduce initial entry testing time and cost, and (g)
develop a methodology designed to reliably identify first-term enlistees as
high performers.

PAYOFF/UTILIZATION:

The payoffs of this Project will include: (a) more effective methods to
recruit, manage, and motivate personnel, (b) reduced attrition and increased
retention of personnel, (c) more effective utilization of personnel, and (d)
improved performance predictors for Navy personnel.

The work in manpower management will effect reductions in the Navy's budget
through avoidance of cost overruns, personnel turbulence, and personnel
system malfunctions. In the area of civilian management, productivity
increases resulting from incentive techniques can be significant, as shown by
the shipyard data processing study which resulted in a conservatively
estimated total savings of $0.5 million per year for data entry operators at

six Navy shipyards. Better morale and its effect on productivity, retention, and attrition will be noted from improvements in techniques for managing people.

PROJECT OVERVIEW

		84	85
PROJECT: F63-522	COMPUTER-AIDED EDUCATION AND CLASSROOM TRAINING	$ 1.5M	$ 1.8M

PE: 62763N   PERSONNEL AND TRAINING TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this program are to develop: (a) computer-aided and computer-managed training, (b) timely and efficient on-site training techniques, (c) a methodology for evaluating training effectiveness through measurement of individual, team, and unit performance, and (d) improved methods for training lower aptitude personnel with language and mathematics skill deficiencies.

The United States must have an effective, well-trained military force to meet its national security commitments. The increasing complexity of modern military operations, equipment, and weapons has caused corresponding problems in military education and training. Moreover, the training community is required to meet increasing training demands while experiencing severe budget constraints. Research and development efforts are needed to identify ways to deliver effective training at a reasonable cost.

In FY 84 this Project will: (a) initiate efforts to couple maintenance training simulators with computer coaches that use artificial intelligence techniques to teach troubleshooting skills in order to reduce training time and instructor resources, (b) initiate the identification of training segments that could be improved through computer-based techniques, (c) complete initial testing of context-free computer-based instruction programs for on-site training, (d) begin development of a generic model which defines the underlying mental processes and skills that enhance problem solving, and (e) develop job-relevant and higher fidelity testing strategies for use in computer-based instruction.

The FY 85 program will: (a) complete experimental tests of context-free and symbolic computer-based instruction programs for on-site training, (b) develop techniques to enhance generic problem solving abilities, (c) evaluate basic skills enhancing techniques for bilingual personnel, (d) demonstrate a prototype intelligent interface between user and computer-based instruction systems, (e) develop procedures for coupling training simulators with computer-based coaches, and (f) evaluate student performance data on prototype electronics troubleshooting simulators and construct tutorial strategies for use by the automated tutor.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) computer-aided and computer-managed training, (b) timely and efficient on-site training techniques, (c) a methodology for evaluating training effectiveness through measurement of individual, team and unit performance, and (d) improved methods for training lower aptitude personnel with language and mathematics skill deficiencies.

PROJECT OVERVIEW

		84	85
PROJECT: F83-528	PERSONNEL PERFORMANCE ASSESSMENT AND ENHANCEMENT	$ 0.2M	$ 0.0M

PE: 62763N   PERSONNEL AND TRAINING TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to standardize stimuli and response
characteristics of human brain electrical activity and develop a methodology
for relating human brain electrical activity characteristics to skill levels
for the purpose of personnel selection and assignment.

In FY 84 this Project will evaluate tests of aviator and sonar operator
cognitive functioning and on-the-job performance, and develop procedures for
administering the event-related brain potential test and other cognitive
tests to measure aviator and sonar operator capabilities.

In FY 85 it is planned to administer the event-related brain potential test
and other cognitive tests to aviator and sonar operator candidates, and
collect training and on-the-job performance data, including the
pass/fail/attrite status of each tested individual. This effort will be
transferred to PE 62758N, Biomedical technology, in FY 85.

PAYOFF/UTILIZATION:

The payoff of this Project is the determination of the feasibility of using
measures of electrical activity in the brain to identify personnel with the
special skills needed for successful completion of training for aviator
and/or sonar operator duties.

PROGRAM ELEMENT OVERVIEW

PE: 63701N   HUMAN FACTORS ENGINEERING

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 1.2M (FY85 PRESIDENT'S BUDGET)
                               FY85 $ 1.9M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to: (a) improve crew and work
station design and evaluation methods, (b) establish target acquisition and
weapon system display interface criteria, (c) develop human performance
assessment and prediction techniques for air combat maneuvering, (d) provide
human factors baseline support for emerging systems, and (e) improve
crew/ship integration capability.

This Program Element provides advanced development and feasibility testing of
human-machine-mission integration methods for application during system
development, and it was established to ensure that appropriate human factors
considerations are incorporated in the engineering design of Navy systems.

In FY 85 this Program Element will continue to address the application of
human factors engineering to weapon system acquisition and airborne system
design.

PAYOFF/UTILIZATION:

The payoff of this Program Element will be the assurance that the proper
human factors considerations are incorporated in the engineering design of
Navy systems, with emphasis on Air Human Factors Engineering and General
Human Factors Engineering technologies.

FUTURE DIRECTIONS:

This Program Element will continue to ensure that appropriate human factors
considerations are incorporated in the engineering design of Navy systems.

PROJECT OVERVIEW

		84	85
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PROJECT: W0542	AIR HUMAN FACTORS ENGINEERING TECHNOLOGY	$ 0.7M	$ 0.7M

PE: 63701N   HUMAN FACTORS ENGINEERING

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL AIR DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to improve aircrew performance in Naval aircraft systems for air combat and airborne command, control and communications.

In FY 84, Projects W1188, W1190, W1191, W1192, W1196, and W1197 were merged to create a new Navy Project (W0542) for Air Human Factors Engineering Technology. The specific deficiency being addressed by this new Project is the failure to include human factors engineering in the design and modification of airborne systems. Techniques are developed to integrate operators and maintainers into systems which exploit technological advances in hardware and software. Improvements in operational capabilities are achieved by applying human factors engineering in airborne systems planning, design, and development.

In FY 84, the program consists of efforts to: (a) complete a field test for the Tactical Aircrew Combat Training System performance data retrieval and analysis system (the data retrieval/analysis will provide accurate measures of the performance of flight pilots), (b) collect data to determine relationships between visual abilities measured on the Vision Test Battery and inflight visual target acquisition performance, (c) conduct an F-18 flight test of voice interactive command/control way points, check lists, fuel status, weapons status, radar operation, tactical control and navigation, and weapons programming.

In FY 85, it is planned to: (a) develop specifications for and initiate efforts to evaluate an air combat performance assessment model, (b) identify variables (e.g., target acquisition, identification, radar lock, missile envelope entry, energy management) which discriminate good versus poor performance, (c) evaluate applications of machine intelligence for management of airborne command and control information, and (d) initiate an inflight test of the P-3C interactive voice command and control of selected functions.

PAYOFF/UTILIZATION:

The payoff of this Project is improved aircrew performance in Naval aircraft systems for air combat and airborne command, control and communications. This will be accomplished by including human factors engineering in the design and modification of airborne systems.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1771	GENERAL HUMAN FACTORS ENGINEERING	$ 0.6M	$ 1.2M

PE: 63701N   HUMAN FACTORS ENGINEERING

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop human factors techniques for
application in the weapon system acquisition process to help solve
man-machine interface problems.

For FY 84 it is planned to: (a) establish a man-system simulation facility,
(b) initiate assessment of tactical information overload and develop
information management aids, (c) develop interactive man-computer methods
adaptive to user skill variations, (d) assess candidate skill reduction
design concepts in selected electronic system acquisitions, (e) provide HFE
guidance to gas turbine propulsion design for new ship program, (f) develop
methods to assess sources of difficulty in performing corrective maintenance,
and (g) assess shipboard ADP systems applications effectiveness.

In FY 85 this Project will: (a) develop tactical decision aids, (b) develop
computer controls that adapt to user needs, (c) provide Human Factors
Engineering guidance for new ship design programs, (d) use a simulation
facility to impr. ve man-computer interface, and (e) improve coordination and
usefulness of shipboard non-tactical ADP systems.

PAYOFF/UTILIZATION:

The payoffs of this Project are solutions for man-machine interface problems
through the application of HFE techniques to weapon system acquisition.

PROGRAM ELEMENT OVERVIEW

PE: 63707N   MANPOWER CONTROL SYSTEMS DEVELOPMENT

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 1.8M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 5.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to provide for the development of
techniques to support the early and accurate identification of manpower
requirements, the cost-effective control of the flow of personnel into,
through, and out of the Navy to fulfill those requirements, and the optimal
utilization of the individual members of the Force to achieve and maintain
high levels of productivity, readiness, and retention. This Program Element
also provides the Navy's response to the Congressional requirement for a
DoD-wide effort to relate selection criteria to successful on-the-job
operational performance.

The Navy will soon be required to implement innovative manpower and personnel
policies and procedures to effectively man an increasing number of ships.
Research is needed to develop and evaluate potential solutions to projected
manning problems associated with the major ship building and system
modernization presently underway. With Congressional constraints on personnel
and personnel costs, the Navy must develop new cost-effective ways of
managing its people, including Reserves and civilians. This program provides
funding for development and testing of innovative personnel management
procedures. Modern technology and new ships will need personnel with the
necessary skills to effectively man the Fleet in order to improve our combat
readiness.

To reduce internal Navy administration, all Projects under this Program
Element were merged into Project Z1770, Manpower and Personnel Development.
To provide for Congressional review of separate efforts, the merged Projects
will be shown as Subprojects.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) improved ability to more
accurately estimate Navy manpower requirements (military and civilian) to
meet changing fleet size and configuration, (b) a significant reduction in
people incorrectly assigned to Navy occupational fields, with a consequent
improvement in fleet readiness and individual satisfaction and retention, (c)
retention of high quality personnel leading to gains in leadership,
organizational commitment, and professionalism, and (d) improved personnel
utilization with accompanying increases in productivity, effectiveness,
readiness and morale.

FUTURE DIRECTIONS:

The future plans for this Program Element are to continue: (a) development of
techniques to support accurate identification of manpower requirements, (b)
The effective cost management of people, including Reserves and civilians,
and (c) using service members in an optimum manner to achieve and maintain
high levels of productivity, readiness, and retention.

MICROCOPY RESOLUTION TEST CHART

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PROJECT OVERVIEW

	84	85
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PROJECT: Z1770 MANPOWER AND PERSONNEL DEVELOPMENT	$ 1.8M	$ 5.1M

PE: 63707N   MANPOWER CONTROL SYSTEMS DEVELOPMENT

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are focused on: (a) Force Planning, which will
determine the numbers and kinds of people the Navy needs and the manner in
which they should be acquired, promoted, assigned, and retained to meet
changing operational requirements and budgetary constraints, (b) Personnel
Selection and Assessment, which looks at the process through which
individuals are selected for Navy service and special programs and how their
subsequent performance is measured and evaluated, and (c) Personnel
Utilization, which deals with the individual on the job and focuses on the
organizational, environmental, and personal factors that can be changed to
improve individual productivity and retention.

To reduce internal Navy administration, all efforts under this Program
Element were merged into Project Z1770, Manpower and Personnel Development.
The Navy is in the process of expanding its personnel to man the 600-ship
force while the population of eligible enlistees is decreasing and the
complexity of operating systems is increasing. This Project will develop
methods to better manage the manpower and personnel system in this changing
environment.

This Project is divided into Subprojects as described below:

Subproject 01, Force Planning. This Subproject will develop computer-based
techniques to: (a) determine accession, promotion, and retention plans to
achieve desired personnel strengths, (b) project the actual costs of those
strengths, (c) identify potential problems in personnel supply (as related to
specific enlisted and officer communities) and develop correct strategies,
(d) forecast support manpower requirements based on size and mix of fleet,
and (e) allocate/assign enlisted personnel to fleet composites and jobs.

In FY 84 the program will: (a) further develop and install the Defense
Planning and Programming Category manpower forecasting techniques, (b)
develop techniques to forecast requirements at indirect support activities
(e.g., medical, personnel), (c) develop an Enlisted Personnel Allocation and
Nomination System for non-rated personnel, as well as techniques to assess
management options for the Navy Enlisted Personnel Rotation System, and (d)
design and develop an officer strength planning capability to plan monthly
accessions and promotions by officer community and grade to achieve
authorized end strengths, while not exceeding budgetary limits.

In FY 85 it is planned to: (a) test and evaluate the Enlisted Personnel
Allocation and Nomination System at the Enlisted Personnel Management Center,
(b) test the techniques to support sea/shore rotation management, (c) develop
a linkage with the Structured Accession Planning System for Officers to
provide coherent force planning from execution through the FYDP and beyond,
and (d) develop computer-based techniques to project the actual cost of

programmed strengths and to detect trends in funding obligations inconsistent with projections.

Subproject 02, Personnel Selection and Assessment. This Subproject will develop: (a) enlistment entrance standards and personnel classification strategies based on identified relationships between individual aptitudes and abilities and the significant task components of job performance, (b) selection instruments and procedures for officers to increase minority representation and overall career retention, and (c) alternatives to correct deficiencies in the Navy's officer performance appraisal system.

In FY 84 the program will: (a) develop criteria and procedures for measuring successful job performance for use in validating entrance standards for enlisted personnel, (b) develop job sample tests and paper/pencil job simulation tests for one enlisted rating, and (c) evaluate the potential for using training simulators as sources of performance information. This is a Congressionally-mandated effort.

In FY 85 it is planned to: (a) evaluate initial job sample and simulation tests and begin development work for additional ratings, (b) complete the survey of training simulators, (c) identify factors relevant to the retention/non-retention of Navy officers as the basis for developing selection instruments that can provide early assessment of these factors, and (d) develop and evaluate alternative techniques for appraising officer performance.

Subproject 03, Personnel Utilization. This Subproject will develop: (a) managerial procedures and job structures necessary to achieve the full benefits of technological advancements being introduced during the transition to the 600-ship Navy and beyond, (b) a computerized decision-aiding system to allow shipboard commanders to maintain maximum readiness under conflicting work, organizational, technological, structural and environmental priorities, (c) a system for identifying the most critically needed enlisted job ratings and incentives to retain high-quality personnel within these ratings, (d) procedures to assist the Navy in effectively meeting the needs of service families with the purpose of improving productivity, effectiveness and readiness through increased morale, and (e) automated procedures for processing Navy Personnel Records.

In FY 84 the program will conduct local area analyses and needs-assessment investigations at several Family Service Center locations to determine command, family, and service members' needs and to develop appropriate Family Service Center programs based upon these results.

In FY 85 it is planned to: (a) improve organizational effectiveness and productivity in the 600-ship Navy by studying the management of technological change, including the development of organizational productivity measures and the determination of the effects of new advanced technology on productivity in the Navy, (b) identify and define organizational and technological problem areas that impact shipboard readiness preparatory to developing corrective intervention strategies for shipboard application, (c) develop procedures to allow simulation of the effects of incentives on retention in critical ratings, and (d) evaluate Family Service Center communication strategies to serve as a basis for the developme t of a management information system to assess the effectiveness of family support programs in relation to readiness and retention.

PAYOFF/UTILIZATION:

The payoffs of this Project include the following:

Subproject 01, Force Planning should improve the Navy's ability to make more

accurate estimates of Navy manpower requirements (military and civilian) to meet the changing fleet size and configuration. Similarly, the products should help improve Navy officer and enlisted inventory management by determining the accession, promotion, and retention levels needed to achieve requirements, and the cost/feasibility of attaining those levels. Force planners will be able to increase the accuracy with which they predict personnel flows so that personnel policies can be designed to reduce skill shortages and excesses.

Subproject 02, Personnel Selection and Assessment will incorporate products from this effort into the Navy's recruit classification and officer selection systems and into the performance appraisal processes for these groups. Their use should lead to a significant reduction in people incorrectly assigned to Navy occupations, with a subsequent improvement in fleet readiness and individual satisfaction and retention. Retention of high quality personnel leading to gains in leadership, organizational commitment, and professionalism should also result.

Subproject 03, Personnel Utilization will improve personnel utilization with accompanying increases in productivity, effectiveness, readiness and morale. Specific payoffs include improved management procedures tailored to new, advanced technological systems. Improvements in family support services should lead to concomitant increases in retention, operational readiness, work satisfaction, and quality of life. Other benefits include lowered incidence of family violence in Navy homes, reduction in stress-related health problems and increased commitment to the Navy by service members and their families.

PROGRAM ELEMENT OVERVIEW

PE: 63720N   EDUCATION AND TRAINING

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 2.2M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 5.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to maintain the Navy's personnel
readiness to meet operational demands in the face of economic restrictions,
manpower competition, and the increasing sophistication of weapons. This
objective is pursued through the development and application of instructional
methods and systems for school and job-site training.

It has become necessary to redefine performance and training standards, to
reduce high training costs, to provide the Fleet with proficient personnel
who are trained in their operational environments, and to improve the
planning of training programs to meet mid- and long-range readiness
requirements. Projects are directed toward improving the efficiency and
effectiveness of training activities ashore and afloat, avoiding the high
costs of technical training, and increasing the proficiency of training
graduates.

Many of the developments generated under this Program Element require
computers, especially microcomputers, to support the training process in, for
example, computer-assisted and computer-managed instruction. The work
primarily concentrates on enlisted training, including basic skills. R&D is
being carried out on officer skills training and other specialized areas such
as team training, training management, automated authoring tools, and
microcomputer training systems. Significant effort is also being devoted to
job assessment and job performance aid (JPA) development.

The work in Program Element 63720N, while often similar in objective and
approach to other Program Elements in the other Services, is unique because
it is tailored to the Navy's organizational structure, population
characteristics and training requirements. Nevertheless, to avoid unnecessary
duplication of effort, extensive preliminary literature reviews are conducted
and a liaison is maintained with the Office of the Under Secretary of Defense
for Research and Engineering and with the Army and Air Force through program
reviews, information exchanges, visits, and special briefings.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include a lightweight, portable,
stand-alone microprocessor training system for Electronic Counter-Counter
Measures (ECCM) which can improve Fleet ECCM readiness and, if used at remote
sites, can greatly reduce costs and time for travel to school-based training.
Large improvements in engineering and operational readiness are expected
since officer and enlisted propulsion personnel can receive 10 to 100 times
more practice with STEAMER than they do now. Shipboard training programs will
enable less experienced journeymen to function as competent instructors by
providing them with detailed instructor guides and supportive training
materials. The programs can also provide realistic training simulations.

Implementation of the JPA-based integrated personnel system can: (a) reduce

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front-end training, (b) increase job relevance of formal training, (c) improve shipboard training, (d) reduce maintenance costs, (e) reduce attrition, (f) increase the use of lower aptitude personnel, and (g) enhance job satisfaction. Job-Oriented Basic Skills (JOBS) training will expand the use of lower aptitude personnel, allow broader recruiting, and increase the pool of reenlistables among ratings historically in shortfall status. Automated systems to design, develop, and produce instructional materials can reduce the cost of preparing instructional materials by 25 percent.

This Program Element has been the advanced development vehicle for the successful application of the computer, both to the direct provision of instruction (CAI, computer-aided instruction) and to the management of instructional processes (CMI, computer-managed instruction). It has also been the primary vehicle for refining and applying job performance aids (JPA's) that improve productivity.

FUTURE DIRECTIONS:

Future efforts will continue to develop and evaluate proficiency measurement, training delivery systems, computer-aided and computer-managed instruction, new methods for preparing instructional materials, and systems for facilitating tactical decision-making.

In the outyears the usefulness, feasibility, cost benefits, and productivity obtained from the Enlisted Personnel Individualized Career System will be determined. The Authoring Instructional Materials Subproject will be tested, enhanced, and made operational. The Individual Technical Training Subproject and the Advanced Computer Aided Instruction Subproject will be completed in FY 86. The Vocational Technical Entry Subproject will be implemented and evaluated. A cost benefit analysis will be conducted, and the system will then be made operational.

The Tactical Decision Training Subproject will be tested and evaluated, and a final system will be developed, tested, and refined. The Functional Context Training materials will be designed and the final system will be developed, evaluated, and implemented. The Low Cost Microcomputer System will be developed, tested, and evaluated in future fiscal years.

The Training Resource Management Subproject will develop a training resources allocation model, which will be evaluated in FY 89. The Team Training ISD Subproject will conduct an operational test and evaluation of multi-ship antisubmarine warfare (ASW) team training in the outyears. The Schoolhouse ISD Subproject is scheduled for FY 89 completion, with an evaluation of savings in time to prepare instructions and provide for quality in the materials.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1772	EDUCATION AND TRAINING DEVELOPMENT	$ 2.2M	$ 5.1M
PE: 63720N	EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to develop methods to deal with continuing technological advancements in weapons systems complexity, to improve.the quality of instructional materials, to shorten training time, and to compensate for the instructor shortfall.

In FY 84 separate projects under PE 63720N were merged into Project Z1772 as the following Subprojects:

Subproject 01, Enlisted Personnel Individualized Career System, will develop, test, and evaluate an integrated personnel system based on job performance aid technology to counter increasing personnel and maintenance costs and decreasing skill levels. In FY 84 the program will collect and evaluate data on instructional packages and on the value of the system. In FY 85 a cost-benefits model of deferred technical training will be prepared.

Subproject 02, Authoring Instructional Materials, will develop automated systems to design, develop, and produce instructional materials for both conventional and computer-delivered courses. In FY 84 this Subproject was not funded. In FY 85 authoring requirements will be defined, hardware specifications will be developed, programming will begin for authoring tools, and software specifications will begin.

Subproject 03, Individual Technical Training, will design curricula to teach low aptitude personnel the skills needed for technical training. In FY 84 curriculum will be modified according to the findings. In FY 85 the operational evaluation will be completed to learn how results can be generalized.

Subproject 04, Advanced Computer-Aided Instruction, will investigate the use of computer-based training both within schools and at remote sites (including aboard ship). Work will focus on critical training needs (propulsion engineering, electronic warfare and electronic countermeasures training). One area (STEAMER) involves the first major use and evaluation of advanced artificial intelligence hardware and software to construct a training system. The system will provide automated tutorial facilities to reduce instructor requirements, and it will enable practice of important exercises that are currently either impossible or very personnel-intensive. The other are; (Remote Sites) is concerned with providing increased readiness through on-site microprocessor-based training in electronic warfare and electronic countermeasures. This work will evaluate refresher training intervals for maintaining these combat skills and the requirements for remote site implementation and support of microcomputer-based training systems. In FY 84 the program will continue to install, evaluate, and refine the STEAMER system, will add advanced tutorial and explanation facilities to STEAMER, and will implement and evaluate remote site electronic warfare and countermeasures

training. In FY 85 it is planned to continue transitioning the training
system to operational use, provide a prototype STEAMER system for Reserve
engineering training, and develop electronic warfare threat analysis training
using microcomputers.

Subproject 05, Vocational Technical Entry, will develop and evaluate a
prototype program to assess the skills of skilled, non-prior service
civilians as petty officers (i.e., lateral entry) for the middle and upper
enlisted paygrades. The program will provide an added source of military
manpower to ease the shortage of skilled personnel, and it may also reduce
training costs. In FY 83 and 84 this subproject was not funded. For FY 85 it
is planned to complete the design, development, and coordination of the
technical skill assessment program as the research transitions from PE
62763N. The Naval Reserve could accept 500 accessions as part of the research.

Subproject 06, Tactical Decision Training, will design and test a prototype
inexpensive, stand-alone training system for practicing tactical
decision-making skills. The system will be usable aboard ship, dockside, or
at other remote sites and will be unique because it will be a small, portable
trainer for individual officers to practice many decision-making skills such
as identification of enemy platforms, selection of weapons, use of
countermeasures, and quick responses to changes in battle situations. The
system will greatly improve tactical proficiency by providing ample practice
in responding to realistic battle problems.

In FY 84 the Subproject will select battle problems for an initial system and
determine hardware and software requirements. In FY 85 it is planned to
implement the initial tactical training system on development machines and
establish a site for development.
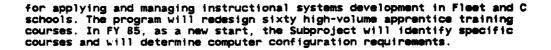
Subproject 07, Functional Context Training, will develop and test a training
system which integrates Functional Context Training, a Personalized System of
Instruction and microcomputer-based simulation. This approach to training
restructures curriculum to be highly job-task oriented, and presents
fundamentals and theory only when a student needs them to acquire job skills.
In FY 84 the program will complete development of a prototype Functional
Context Training system and will begin an evaluation that will be completed
in FY 85.

Subproject 08, Low Cost Microcomputer System, will examine, design, construct,
and test low-cost portable, microcomputer-based training systems using
realistic operational situations to improve Navy training productivity at
acceptable costs. In FY 84 the Subproject started developing courseware and
software and started prototype applications. In FY 85 it is planned to begin
transition plans for software delivery on compatible systems and to develop
the logistics for large scale application (including maintenance) of software
updates and instructor training.

Subproject 09, Training Resource Management, will develop a model for
coordinating and allocating Fleet and school training responsibility based on
diagnostic evaluations of schoolhouse and Fleet training facility
capabilities. It will determine optimum times, sequencing, and location for
types of training. In FY 85, as a new start, the Subproject will obtain data
on present allocation methods.

Subproject 10, Team Training ISD, will analyze major team training needs
which affect readiness, such as task analysis, performance standards, and
deficiencies in transferring individual skills to tactical teams. In FY 85,
as a new start, this Subproject will build on exploratory development work.

Subproject 11, Schoolhouse ISD, will develop, test, and evaluate procedures

for applying and managing instructional systems development in Fleet and C schools. The program will redesign sixty high-volume apprentice training courses. In FY 85, as a new start, the Subproject will identify specific courses and will determine computer configuration requirements.

PAYOFF/UTILIZATION:

The payoffs of this Project include the following:

Subproject 01 could reduce initial training by 50-80 percent and increase productivity up to 60 percent.

Subproject 02 could reduce by 25 percent the cost of preparing instructional materials. It will automate instructional material preparation and improve training program development.

In Subproject 03 the expanded use of lower mental quality personnel will increase the pool of eligible enlistees in historically short-supply ratings and will help maintain racial/ethnic representation across Navy occupational specialties. Initial results show that the broadened recruiting base has lowered recruiting costs for some trainees by up to 30 percent, and trainees have a first term attrition rate at least 50 percent below other personnel.

Subproject 04 is expected to increase Fleet readiness by increasing practice of critical skills at much lower costs than existing methods. STEAMER will also greatly reduce the costs and time for school travel time when used at remote sites and aboard ship.

Subproject 05 could decrease by up to 50 percent the time needed to stabilize the petty officer shortfall and produce multimillion dollar savings in training costs.

Subproject 06 may provide 10 times more opportunities for practicing decision making skills. It can provide cost-saving pre-practice in other training to reduce expensive simulator time and costly naval exercises.

Subproject 07 is expected to: (a) reduce training time by 10 percent, (b) lower aptitude requirements by 10 percentile ranks, (c) improve student motivation/interest, and (d) increase trainee ability to perform specialized training tasks.

Subproject 08 could decrease the time, effort, and cost of microcomputer-based training by 25 percent.

Subproject 09 could avoid significant costs due to scheduling inefficiencies by compiling a comprehensive data base of location, sequence, duration, and content of training.

Subproject 10 could improve antisubmarine warfare team performance.

Subproject 11 would save considerable time in courseware preparation and revision and increase the consistency and quality of instruction.

PROGRAM ELEMENT OVERVIEW

PE: 63727N   ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 1.7M (FY85 PRESIDENT'S BUDGET)
                            FY85 $10.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to improve antiquated methods
currently in use for procuring, generating, storing, reproducing,
distributing and controlling technical information within the Navy. These
methods are labor intensive, error prone, unresponsive and costly. To help
correct such problems, the Chief of Naval Operations requested an R&D effort
to develop a comprehensive Navy Technical Information Presentation System
(NTIPS). When completed and implemented, NTIPS will be a Navy-wide system to
consolidate and supervise the acquisition, generation, distribution, and
control of all weapons systems Technical Information for use in weapon system
operation, maintenance, training, and logistics support.

Project T1805, Navy Automated Publishing System, will develop a completely
integrated, automated publishing system featuring printing on-demand and
electronic storage and retrieval. The growing volume of Navy publications and
the ever-increasing demand for the documents are outstripping the resources
available for their preparation, production, storage, distribution and
control. The problems are made worse by the proliferation of media (paper,
microform, electronics, audio-visual) and increasing diversity of forms and
formats which are reflected by the complexities of updating, tracking,
storage and retrieval. Currently, over 50 percent of the total printing and
publishing workload requested of the Navy Printing and Publication Service by
Navy customers must be procured by outside sources. Project T1806, Logistics
Systems Information Network, will provide the ability to rapidly assess
important logistical data that is virtually impossible with the techniques,
equipments and procedures available today. Lack of an integrated logistic
information communication network for all weapons systems continue to hamper
logistic support and investment decisions.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) a Navy Technical Information
Presentation System that will increase Fleet readiness, reduce manpower and
support costs by improving methods for procuring, generating, storing,
reproducing, distributing and controlling technical information within the
Navy, (b) a completely integrated, automated publishing system featuring
printing on-demand and electronic storage and retrieval, and (c) a Logistics
Systems Information Network which will provide the ability to rapidly assess
important logistical data that is virtually impossible with the techniques,
equipments and procedures available today.

FUTURE DIRECTIONS:

The development of full NTIPS system capability is scheduled for completion
in FY 88. The final output of this effort is anticipated to include a
complete description of system design, instructions and standards, a proposed
Navy organization for handling system Technical Information, the required

data base and control information system, proposed electronic delivery
devices and an automated production system.

Test and evaluation of the integrated Navy Automated Publishing System design
will be continued using an increasing number of various media types to
determine the most efficient system configuration. Then the system will be
implemented.

The Logistics Systems Information Network will make advancements in local
area networking, personal desktop computers, mass memory devices (e.g.,
optical or vertical magnetic disks), voice systems, and global networking.

PROJECT OVERVIEW

		84	85
PROJECT: T1805	NAVY AUTOMATED PUBLISHING SYSTEM	$ 0.0M	$ 5.0M

PE: 63727N   ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to continue exploratory development that
has been carried out on automated publishing since FY 80. These efforts in
the Navy Automated Publishing System have been focused in the following
areas: (a) Navy Printing on Demand - a technology to permit printing of
specifications and standards on a real-time, as-required basis to eliminate
costly and obsolescent shelf inventory, and (b) Technical Document and
Retrieval System - a technology to store and retrieve technical drawings and
specifications quickly and efficiently through the use of advanced storage
and retrieval equipment. These areas and several other Navy Automated
Publishing System areas will require test and evaluation of integrated
networks for the source data entry, transmission and reproduction of data at
the local level and over a wide area. Procurement of the various media for
processing and transmitting data will be required.

In FY 85 this Project will: (a) begin to evaluate the full system
characterized by highly interactive workstations and high speed
communications links to integrate a multiple computer with large data bases,
(b) test increased use of high-resolution graphic display screens, increased
use of optical disk and digitized magnetic storage devices, and standardized
higher-level programming languages, and (c) exercise standardized vendor
protocols, convergence of office and graphics arts systems, and the ability
to operate virtually any output device from any workstation.

PAYOFF/UTILIZATION:

The first payoff of this Project includes making printed documents available
on demand to Navy units. Ultimately, users will be able to request printed
documents on cathode ray tube terminals and, almost instantaneously, have the
requested document disbursed and/or printed-on-demand at the requesting
activity or other designated locations. When telecommunication costs are
lowered, electronic printing will be distributed to Navy Publications and
Printing Service plants throughout the country. An automated keyword search
and "menu" system will also facilitate the location of the required documents.

The second payoff will make management data available to permit reassignment
of printing workload, improving personnel utilization and scheduling control
of normal and expected actions. Responsiveness to all types of publication
needs will be improved, certain administrative burdens of the operating fleet
will be reduced, printing costs will be lowered, and overall productivity
will be enhanced.

PROJECT OVERVIEW

	84	85
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PROJECT: T1806 — LOGISTICS SYSTEMS INFORMATION NETWORK	$ 0.0M	$ 2.2M

PROJECT: T1806   LOGISTICS SYSTEMS $ 0.0M $ 2.2M
                        INFORMATION NETWORK

PE: 63727N   ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop, test, and evaluate a
Navy-wide information network concept for on-line access to a range of
logistics data bases required to support fleet and shore supply and
maintenance operations, (b) provide new source data entry, distributed
processing, data base management and decision support techniques to decrease
response time and transmission costs, and to increase reliability of data,
and (c) develop standards and guidelines for incorporating new automatic data
processing software, hardware and data communications technology within the
operational logistics community.

In FY 85 it is planned to determine the applicability of data base, machines,
and communications technology development required in logistics applications
in the 1990 - 2000 time frame and investigate the application of optical disk
for mass data, network concepts and multi-media users.

PAYOFF/UTILIZATION:

The payoff of this Project is a Navy-wide information network concept for
on-line access to a range of logistics databases required to support fleet
and shore supply and maintenance operations.

PROJECT OVERVIEW

		84	85
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PROJECT: W1032	NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM	$ 1.7M	$ 3.3M

PE: 63727N   ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to design and test an improved, cost-effective Navy-wide standard system for acquiring, generating, mastering, replicating, distributing, and controlling Technical Information to be used by those who operate and maintain Navy weapon systems.

Present problems include: (a) increasing complexity and volume of such documentation (currently in the form of Technical Manuals) to keep pace with weapon system complexity, (b) decreasing reading capability of Navy recruits, (c) operationally costly delays in providing initial documentation, (d) duplication of effort in providing technical information to both the training and logistic communities, and (e) escalating costs of developing, distributing, and storing technical documentation.

In FY 84 the program will: (a) complete the Navy Technical Information Presentation System tests using the F-14A Flight Control System and the AN/SPA-25D Radar as test beds, (b) begin the prototype operation of the Navy Technical Information Presentation System, (c) support the Chief of Naval Material in continuing the implementation of Navy Technical Information Presentation System procedures, data bases, and technology support measures, and (d) continue to exercise leadership in research and development for advanced Technical Information Systems.

In FY 85 it is planned to continue the prototype operation of the Navy Technical Information Presentation System at the Naval Air Station and Shipyards, the implementation of Navy Technical Information Presentation System technology, and the exercise of research and development leadership.

PAYOFF/UTILIZATION:

The payoffs of this Project include the exploitation of new technologies such as logistic support analysis, computerized authoring, computer graphics, advanced data base design, videodisk, holography, digital storage, satellite communications, and human factors engineering. The system will develop ways of providing Technical Information for all users from the same data base in such a way as to be of optimal use to individual enlisted technicians.

PROGRAM ELEMENT OVERVIEW

PE: 63732M   MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                              MANPOWER & PERSONNEL
                              SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: MC

FUNDING: FY84 $ 2.1M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 3.0M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide the RDT&E funds for the
advanced development of systems and equipment to improve the manpower and
training readiness of the Fleet Marine Forces.

This objective will be met by work in the following areas: (a) human
resources management and forecasting, (b) training devices and simulators,
(c) Marine Corps training resources development and analysis, and (d) Marine
Corps professional military education.

PAYOFF/UTILIZATION:

The payoff of the Program Element will be enhanced fleet Marine readiness due
to improved manpower training, planning, and control. Work under this Program
Element will result in: (a) techniques and methods that advance the use and
control of human resources in the Marine Corps, (b) development of training
devices and simulators not developed in conjunction with a major end item,
(c) methods and techniques to improve the effectiveness of training conducted
throughout the Marine Corps, and (d) new instructional delivery systems such
as teleconferencing and interactive video.

FUTURE DIRECTIONS:

Future directions for this Program Element include: (a) the continued
development of manpower methods and procedures in support of the Precise
Personnel Assignment System, (b) work on the STAGS-TOW (Simulated Tank
Antiarmor Gunnery System-Tube Launched Optically Tracked Wireguided Missile
System) prototype, (c) operation and evaluation of the Instructional
Management System prototype, and (d) investigation of the interactive video
technology.

PROJECT OVERVIEW

		84	85
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PROJECT: C0073	HUMAN RESOURCES MANAGEMENT AND FORECASTING	$ 1.7M	$ 1.7M

PE: 63732M   MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: MC

RESPONSIBLE ORGANIZATION: HEADQUARTERS, USMC

PROJECT SYNOPSIS:

The objective of this Project is to develop innovative techniques and methodologies that improve manpower planning and control by advancing the utilization and direction of human resources.

The specific systems developed under this program include Computerized Adaptive Testing (CAT), the Automated Recruit Management System (ARMS), and the Precise Personnel Assignment System (PREPAS).In FY 84, the project will: (a) continue development of an Objective Force Model and Process for Enlisted Promotion Planning, (b) continue development of the Career Planning Management System, (c) begin development of an Officer Planning System to assist planners in shaping future officer personnel targets, (d) begin development of a Manpower Mobilization Planning System which will assist planning for sustaining a mobilized force, (e) initiate Stage 2 (full scale development) of CAT system development, and (f) transition the following exploratory development projects: Analysis of Enlisted Waiver Procedures, Assessment of First-Term Attrition of Women Marines, Transitional and Organizational Interventions, and Map Interpretation and Terrain Analysis Course.

In FY 85, it is planned to: (a) continue development of manpower methods and procedures in support of the Precise Personnel Assignment System, (b) complete development of an Objective Force Model and an automated process for Enlisted Promotion Planning which will assist planners in shaping future personnel targets, (c) continue development of a Career Planning Management System, (d) continue development of a Manpower Mobilization Planning System, (e) continue development of an Officer Planning System, and (f) complete Stage 2 (full scale development) of CAT system development.

PAYOFF/UTILIZATION:

The payoffs of this Project will be as follows: (a) CAT will improve military applicant selection and classification testing by reducing test time and increasing test accuracy in measuring applicant ability, (b) ARMS will provide a centralized, integrated system to support recruiting functions, and (c) PREPAS will prevent turbulence, improve control of manpower resources, and increase the Commander's ability to control unit personnel.

PROJECT OVERVIEW

		84	85
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PROJECT: C0074	TRAINING DEVICES AND SIMULATORS	$ 0.1M	$ 0.3M
PE: 63732M	MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	MC		
RESPONSIBLE ORGANIZATION:	HEADQUARTERS, USMC		

PROJECT SYNOPSIS:

The objective of this Project is to develop training devices and simulators
which are not or cannot be developed in conjunction with a major end item.

Two products of this Project are: (a) the Simulated Tank Anti-Armor Gunnery
System (STAGS), a device for training infantrymen in field firing anti-tank
weapons without need for ranges, ammunition, or weapons, and (b) the Manual
Wargame Based Tactical Training System (MWG), a series of training systems to
give unit commanders and their staffs an opportunity to practice the tactical
decisions they would have to make on a real battlefield.

In FY 84, the Project consists of: (a) development of the Simulated/Tank
Anti-tank Gunnery System for the TOW (Tube Launched Optically Tracked
Wireguided Missile System), and (b) advanced development of the Modular
Universal Laser Equipment (MULE) and the Grand Laser Locater Designator
(GLLD).

In FY 85, .t is planned to: (a) contract for production of the STAGS-Dragon,
(b) continue work on the STAGS-TOW prototype, and (c) continue developmental
testing of STAGS for the MULE and the GLLD.

This Project will be completed in FY 85.

PAYOFF/UTILIZATION:

The payoffs of this Project will be to: (a) provide rapid dissemination and
assimilation of new tactics and doctrine, (b) provide practice in
decision-making for line and staff personnel relative to the present threat
situation, and (c) save money by conducting training without a full field
exercise. Personnel will also be able to be trained while they are in standby
status or on board ship. Training can be updated as weapon innovations occur.
Also, forms of staff training not now practicable will be made possible.

PROJECT OVERVIEW

	84	85
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PROJECT: C0867   MARINE CORPS TRAINING $ 0.2M $ 0.9M
                     RESOURCES DEVELOPMENT
                     AND ANALYSIS

PE: 63732M   MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: MC

RESPONSIBLE ORGANIZATION: HEADQUARTERS, USMC

PROJECT SYNOPSIS:

The objective of this Project is to identify methods and techniques to
improve the effectiveness of training conducted throughout the Marine Corps.

In FY 84, the Project consists of: (a) installation and evaluation of the
prototype Instructional Management System (IMS) at Camp Lejeune, N.C., (b)
completion of a Feasibility Study and Economic Analysis for Computer-Assisted
Instructional Systems Development (CAISD), (c) conduct of an analysis of
Computer-Assisted Instruction requirements to determine the feasibility of
automated instruction in support of the fixed mastery variable time concept,
(d) continued development of systems documentation for the IMS, and (e)
development of the Feasibility Study and Economic Analysis for the Training
Requirements and Resource Management System (TRRMS).

In FY 85, it is planned to: (a) continue operation and evaluation of the IMS
prototype at Camp Lejeune, (b) continue development of systems documentation
for the IMS, and (c) continue analysis of Computer-Assisted Instruction
requirements to determine feasibility of automated instruction in support of
Marine Corps formal schools.

PAYOFF/UTILIZATION:

The payoff of this Project will be enhanced efficiency of the Marine Corps
training establishment and effectiveness of the training provided. Current
and future research will center upon developing effective and economically
feasible concepts and methodologies for employing automated training
technology.

PROJECT OVERVIEW

		84	85
PROJECT: C1732	USMC PROFESSIONAL MILITARY EDUCATION	$ 0.1M	$ 0.1M

PE: 63732M   MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: MC

RESPONSIBLE ORGANIZATION: HEADQUARTERS, USMC

PROJECT SYNOPSIS:

The purpose of this Project is to design, test, and evaluate new
instructional delivery systems such as teleconferencing and interactive video,
which may be identified as effective alternatives for improving the Marine
Corps professional military education program.

In FY 84, this Project will continue analysis of alternative methods which,
based upon the results of previous exploratory development, show potential
for improving instruction in resident and nonresident courses.
Teleconferencing is the media presently being explored.

In FY 85, it is planned to: (a) thoroughly investigate the interactive video
technology available (at present, this media appears to be the most
promising), (b) continue to investigate and develop the methodology and
techniques necessary to improve the efficiency of the training establishment
and the effectiveness of the training provided in resident and nonresident
professional military education courses, and (c) conduct an analysis of the
use of cable and satellite television for one-way and two-way audio to
improve nonresident instruction in the formal schools.

PAYOFF/UTILIZATION:

The payoff of this Project will be new instructional delivery systems, such
as teleconferencing and interactive video. These systems have the potential
for greatly improving the Marine Corps professional military education
program, both in resident and nonresident courses.

PROGRAM ELEMENT OVERVIEW

PE: 63733N   TRAINING DEVICES TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 6.6M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 7.8M (FY85 PRESIDENT'S BUDGET)

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PE SYNOPSIS:

The objective of this Program Element is to develop and demonstrate new
capabilities in training technology and equipment.

Principal focus is on proof-of-concept, risk reduction, and cost
effectiveness in device acquisition (approximately $800 Million in FY 84).
Current technical areas include advanced simulation of visual and sensor
systems, part-task, low cost training alternatives, and intelligent systems
and wargaming. Efforts of this program provide the main developmental links
between Program Element 62757N, Human Factors and Simulation Technology, and
first-article procurement in aviation, surface, and subsurface systems.

In FY 84, Projects previously included in this Program Element were
consolidated into a single Project (W1773) with six Subproject product areas
to allow flexibility in structuring technology development to satisfy
acquisition program needs. These six Subproject areas are: (01) Training
Technology Demonstration/Utilization, (02) Visual Systems Simulation
Development, (03) Computer Technology for Training Systems, (04) Part-Task
Training Alternatives, (05) Intelligent Training Systems Development, and
(06) Sensor Simulation Development. For FY 85, W1773 was reduced by $2,639
due to budgetary constraints.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include new capabilities in training
technology and equipment, with principal focus on proof-of-concept, reduction
of risk, and cost effectiveness in training device acquisition. It is
estimated that millions of dollars could be saved as a result of the work
done under this Program Element.

FUTURE DIRECTIONS:

Work for this Program Element will continue in the areas of simulation of
visual and sensor systems, training alternatives, and intelligent systems.

PROJECT OVERVIEW

	84	85
PROJECT: W1773	TRAINING DEVICES TECHNOLOGY	$ 6.6M $ 7.8M

PE: 63733N   TRAINING DEVICES TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop and demonstrate new capabilities
in training technology and equipment, with emphasis on proof-of-concept,
reduction of risk, and cost effectiveness in device acquisition.

This Project is divided into six Subprojects as described below:

Subproject 01, Training Technology Demonstration and Utilization. This
Subproject will provide testbed facilities for proof-of-concept and training
effectiveness evaluations and for demonstration of new technical capabilities
developed under exploratory and advanced development. The Visual Technology
Research Simulator provides a testbed for hardware performance research to
improve state-of-the-art flight simulator visual technology and for human
performance research to evaluate the effect of visual technology on pilot
performance and transfer of training effectiveness in a simulator
environment. The ASW Simulation Research Facility will evaluate ocean and
target modules, determine display requirements, and demonstrate system
concepts. Users include LAMPS MK III, CH-53E, AV-8B, F/A-18 and sonar
communities. In FY 84, the program will: (a) continue Vertical Takeoff and
Landing trainer design criteria investigations, (b) evaluate Conventional
Takeoff and Landing design criteria, and (c) conduct visual simulation in the
Vertical Takeoff and Landing Simulator for shiphandling underway
replenishment task. In FY 85, it is planned to continue: (a) preparing for
implementation of multi-sensor simulation, (b) evaluating helicopter
simulator design criteria for fleet pilot non-aviation ship (FFG-7 Class
Frigate) landing training in adverse weather, (c) completing Eye-Slaved
Display Integration and Test Evaluation, and (d) integrating the ASW
Simulation Testbed from Subproject 06, Sensor Systems Simulation.

Subproject 02, Visual Systems Simulation Development. 'vailable visual
simulation technology is not adequate to provide high detail imagery over a
wide field of view for air/ground and weapons delivery tasks. This Subproject
focuses on area-of-view at reduced cost and development of a low cost visual
simulator for shiphandling (full bridge) simulator. Users are
air/surface/subsurface weapon system platforms. In FY 84, this program will:
(a) continue procurement of the Helmet Mounted Display, (b) continue
development of procurement specifications for the Computer-Image Generation
Testbed, and (c) commence development of display technology for shiphandling
and harbor navigation. In FY 85, it is planned to accept delivery of Helmet
Mounted Display feasibility model and continue development of display
technology for shiphandling and harbor navigation.

Subproject 03, Computer Technology for Training Systems. This Subproject will
use a model computer architecture for trainers, with multiple microcomputers
and control algorithms to develop specific minimum cost simulation/training
system models for wargaming, tactics, sensor operators, and other

applications. Over 60 percent of simulator life cycle costs are associated
with computer hardware and software, and the approaches developed here can
substantially reduce these costs. Users include VTXTS, P3 and future training
systems for sensors, weapon delivery, wargaming, tactics, and command and
control. In FY 84, the program will: (a) continue design of the advanced
development model, (b) finalize design of the computer system architecture,
(c) identify hardware for procurement, and (d) identify software constraints.
In FY 85, it is planned to continue: (a) procuring required development
hardware/firmware/software, (b) fabricating demonstration system, (c)
partitioning software and performing model programming, and (d) initiating
system design analysis of sensor simulators and weapon delivery model
demonstrations.

Subproject 04, Part-Task Training Alternatives. This Subproject focuses on
cost effectiveness in training devices via development of alternative
technology for certain segments of high-cost training. In the past, the
emphasis in training device development has been to provide sufficient
fidelity to allow trainee practice. This emphasis is shifting toward
providing adequate preparation on mission-critical elements of tasks so that
large training devices can be used more effectively. Adaptive training,
automated performance assessment, voice technology, expert systems, and
microprocessor technology developed in exploratory programs will be
implemented for test and evaluation. Results of this work will be implemented
in A-6E, F-14, F/A-18, Multi-Platform Tactical Team Training and Maintenance
Training. In FY 84, this program will develop a tactical navigation trainer,
including validation and modification. In FY 85, it is planned to continue:
(a) prototype design and functional specification for an Air Combat
Maneuvering Performance Measurement System, and (b) an air intercept trainer.

Subproject 05, Intelligent Training Systems Development. This Subproject
focuses on automation, augmentation, and workload reduction of instructor and
training personnel functions in order to improve productivity and
effectiveness of training devices. Artificial intelligence, voice technology
and training assistance packages, including simulation of targets and missing
team members, are technologies being developed and evaluated for applications
to embedded, on-board operational systems and shore-based trainers.
Interfacing techniques for team, operator, and maintenance training will be
evaluated. Work in this area suggests gaming approaches to the development of
specific warfare skills. Users include Perry Class Pierside Trainers,
Embedded Training Systems and team tactical trainers. In FY 84, program plans
will be developed and target systems identified based on recent developments
in artificial intelligence. In FY 85, it is planned to develop missing team
members models for Surface Combat System Team Trainers.

Subproject 06, Sensor Systems Simulation. This Subproject will develop the
capability to simulate sensors employed in air, surface, and subsurface
weapon system platforms. One approach is to combine computer generated
imagery techniques with computer synthesis of imagery from actual
photographs. Forward-looking Infrared, Low Light Level TV, sonar and radar
sensor systems must be modeled and correlated with simulated visual systems
to provide trainees with consistent data. Requirements generated by the Air
Warfare Training Group to develop sensor simulation capabilities for the
F/A-18 aircraft are being addressed. Other users include CH-53E and
air/surface platforms using multiple sensors, including ASW. In FY 84, this
Subproject will: (a) initiate a real-time technology demonstration of the
hybrid Computer Generated/Synthesized Imagery approach, (b) initiate
evaluation of training acceptability and efffectiveness, and (c) establish an
ASW Testbed to demonstrate the performance of ocean and target models
developed under exploratory development. In FY 85, it is planned to
transition the ASW Testbed to proof-of-concept testing under Subproject 01,
Training Technology Demonstration and Utilization.

PAYOFF/UTILIZATION:

The payoffs of this Project include the following:

Subproject 01 can save an estimated $22 Million by optimizing the design of the 22 VTXTS simulators using data from the Visual Technology Research Simulator. Subproject 02 can reduce the cost of visual systems by two-thirds (from $25-30 Million to $7-10 Million) while improving visual performance. The modular approaches to microcomputer hardware and applications software developed in Subproject 03 can reduce life cycle costs by 40-60 percent. For example, the cost of the new Acoustic Operator Trainer (Device 14E35), currently $39 Million, could be reduced to an estimated $4 Million using results of Subproject 03. Subproject 04 is targeted to reduce, by 20 percent, the time needed for trainees to become proficient in teams by rapidly teaching specific operator skills. In addition, portable stand-alone maintenance aids will provide an estimated 10 percent reduction in required classroom training time, standardization of air combat maneuvering training will save an estimated 15 percent of fuel and 10 percent of operational training time, and improved instructor station design will increase training efficiency 14 percent. Subproject 05 could reduce training time by 8-15 percent using artificial intelligence techniques and gaming approaches. Subproject 06 could result in savings estimated at $3 Million per simulator using Computer Generated/Synthesized Imagery for Forward-looking Infrared. Further, the cost of digital radar land mass simulation for synthetic aperture radar can be reduced from the current $68 Million to $17 Million as a result of work in Subproject 06.

PROGRAM ELEMENT OVERVIEW

PE: 64703N   TRAINING AND PERSONNEL SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL
                              SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 3.3M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 6.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to meet the requirements of the
Chief of Naval Operations, Fleet Commanders in Chief, and the Chief of Naval
Education and Training for: (a) more efficient manpower and personnel
planning systems, (b) improved acquisition, retention, and utilization of
personnel through system development, (c) more efficient and effective
training activities ashore and afloat, (d) reduced costs for operational
technical training, (e) increased training proficiency by design and test of
specific training systems, (f) increased general-purpose use of simulation
systems in training which can reduce training costs, increase individual/team
training effectiveness, and improve job proficiency through demonstrated
system effectiveness, (g) improved crew and work station design and
evaluation techniques, and improved human performance assessment and
prediction methods for air combat maneuvering, (h) improved human factors
baseline support for emerging systems, and (i) improved crew-systems
interfaces. All work in this Program Element is aimed at producing systems
ready for implementation in Navy manpower, personnel and training acquisition
programs.

Some other objectives are to provide training in operations that would be
unsafe or impossible in live circumstances, to train personnel to perform
tasks and functions of new weapon systems, and to improve tactical, team, and
crew training in single and multi-system situations in all threat
environments. Other objectives are to reduce requirements for steaming and
flying, to maintain personnel proficiency, to diagnose deficiencies in
performance, and to improve and ensure that training is integrated with new
system developments.

In FY 84, Project Z1385 (Computer Adaptive Testing) was transferred from
Program Element 64709N in order to dedicate that Program Element to efforts
of value to all Services. During FY 84, Project efforts under this Program
Element will be to develop three alternative prototype Computer Adaptive
Testing Systems and continue development of software and hardware for the
enhanced Naval Warfare Gaming System.

Beginning in FY 85, all existing Projects will be merged into two Projects,
Z1822 (Manpower and Human Factors Engineering) and Z1823 (Training and
Training Device Systems Development), following the guidance of the Secretary
of the Navy to reduce the number of Projects. FY 85 efforts for these
Projects include operational implementation of a prototype Computer Adaptive
Testing System, and initiation of Prototype Fabrication and complete testing
of the Expendable Mobile Anti-Submarine Warfare (ASW) Training Target.

PAYOFF/UTILIZATION:

The Payoffs of this Program Element include the following: (a) improved
testing procedures for enlisted personnel selection and classification using

Computer Adaptive Testing, (b) comprehensive training in battle group level tactical decision making, (c) reduced fuel expenditures for surface vessel exercises and aircraft flight, (d) conservation of ammunition and minimized political and environmental impact of firing live ammunition, and (e) enhanced safety with which skills in otherwise high-risk situations are achieved.

To date, these projected benefits have been realized. Several training devices developed under this Program Element are now being used for training. Two of these devices are the BQQ-5 Sonar Operator Trainer and the Mine Warfare Trainer. Prior to FY 82, significant progress was also achieved on the fabrication and testing of the Automated Air Intercept Controller Trainer, Simulated Avionics Maintenance Trainer, and Class A Electronic Equipment Maintenance Simulator. In addition, the Submarine Advance Signal Training System project and the Fixed Pipper Gunnery Simulator project were completed.

In FY 82, an interim Battle Group Tactical Trainer was developed and evaluated by the Naval Ocean Systems Center (NOSC).

FUTURE DIRECTIONS:

In FY 86, it is planned to complete system hardware procurement for the Enhanced Naval Warfare Gaming System. Outyear plans include continuing evolutionary software development to meet refined operational requirements.

PROJECT OVERVIEW

		84	85
PROJECT: X1328	BATTLE GROUP TACTICAL TRAINER	$ 2.8M	$ 0.0M

PE: 64703N   TRAINING AND PERSONNEL SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to provide an interactive, computer-based tactical simulation training system to give Battle Group Level training to senior Naval officers (such as prospective or incumbent Commanders, Chiefs of Staff, Operations Officers, Squadron Commanders, Staff Officers, Carrier Air Group Commanders, and Commanding Officers of major combatants) to be trained in tactical decision making, operational planning, and Command and Control.

In FY 84, it is planned to continue developing the software and hardware.

In FY 85, this Project will be merged into Project X1823 as Subproject 02.

PAYOFF/UTILIZATION:

The payoff for this Project is improved Battle Group Level training for senior Naval officers.

PROJECT OVERVIEW

	84	85
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PROJECT: Z1385   COMPUTER ADAPTIVE TESTING $ 0.5M $ 0.0M

PE: 64703N   TRAINING AND PERSONNEL SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Joint-Service Project is to develop and evaluate a
computerized testing system that will replace existing paper-and-pencil Armed
Services Vocational Aptitude Battery (ASVAB) tests used for enlisted
personnel selection and classification.

The existing ASVAB has a number of inherent problems such as excessively long
test sessions, imprecision at high and low aptitude levels, in addition to
susceptibility to theft and compromise, high costs for printing, distribution,
and storage, susceptibility to clerical errors in recording, converting and
computing scores, and long lead time and high expense in developing
replacement test forms. This computer-based system will adapt itself to the
aptitude levels of the examinees.

In FY 84, this program will develop and evaluate three alternative prototype
systems.

In FY 85, this Project will be merged into Project Z1822, Subproject 01.

PAYOFF/UTILIZATION:

The payoff of this Project will be more effective and efficient military
classification testing.

Testing time will be cut by 50 percent, thus saving over a million examinee
man-hours and 90,000 test administrator man-hours each year. Compromise of
test security will be eliminated, and clerical errors significantly reduced
through automated scoring and score recording. Accuracy of aptitude
measurement will be improved, with the potential for reducing enlisted
personnel attrition. Costs associated with test printing, distribution, and
manual operations will be reduced. A preliminary estimate is that the
automated system will save $5M each year in operating costs. Development of
test procedures specifically for computer administration has the potential to
be the first major breakthrough in testing technology since World War II.

PROJECT OVERVIEW

		84	85

PROJECT: Z1822   MANPOWER AND HUMAN $ 0.0M $ 1.2M
FACTORS ENGINEERING

PE: 64703N   TRAINING AND PERSONNEL SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL SEA SYSTEMS COMMAND

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop, test, and evaluate
technologies to improve manpower requirements determination, recruitment,
selection, assignment, attrition and retention, and personnel utilization,
and (b) develop prototype human factors engineering technologies to trade off
system complexity, cost, and manpower which will ensure high levels of
operational performance.

In FY 85, this Project will become active and will be composed primarily of
Subproject 01 (formerly Project Z1385 under Program Element 64709N), Computer
Adaptive Testing. This Subproject is a joint-Service effort and will develop
and evaluate a computerized testing system that adapts to the aptitude levels
of the examinees. This system will replace existing paper-and-pencil Armed
Services Vocational Aptitude Battery (ASVAB) tests used for enlisted
personnel selection and classification.

PAYOFF/UTILIZATION:

The payoffs of the Project include: (a) reduced training costs, (b) improved
accuracy of enlistments and assignments, and (c) improved accuracy of
aptitude measurement.

Estimated benefits from this Project will be that: (a) testing time will be
cut by 50 percent, thus saving over a million examinee man-hours and 90,000
test administrator man-hours each year, (b) compromise of test security will
be eliminated, (c) erroneous enlistments and assignments as a result of
clerical errors will be eliminated, (d) accuracy of aptitude measurement will
be improved, with the potential for reducing enlisted personnel attrition,
and (e) costs associated with test printing, distribution, and manual
operations will be reduced. A preliminary estimate is that the automated
system will save $5,000,000 each year in operating costs.

PROJECT OVERVIEW

	84	85
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PROJECT: Z1823   TRAINING AND TRAINING $ 0.0M $ 5.3M
                  DEVICE SYSTEMS
                  DEVELOPMENT

PE: 64703N   TRAINING AND PERSONNEL SYSTEM DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop, test, and evaluate
technologies to improve overall training and training device requirements,
selection, assignment, and utilization effectiveness, and (b) develop
prototype devices to enhance training and trade-off system complexity, cost,
and manpower which will ensure high levels of operational performance.

This Project is divided into Subprojects as described below:

Subproject 01 (formerly Project S1017), Expendable Mobile Anti-Submarine
Warfare (ASW) Training Target. This Project develops an open-ocean ASW
target. The target requires no specialized range, simulates returns from all
fleet sonar equipment, is compatible with fleet magnetic anomaly detection
equipment, and is usable by surface and airborne units. This will be a
realistic ASW target model that can function in the open ocean with
appropriate speed, depth and course control, drag, and acoustic and magnetic
signatures. In FY 85, this Subproject will become active. It is planned to
initiate Prototype Fabrication and complete testing.

Subproject 02 (formerly Project X1328), Battle Group Tactical Trainer. This
Subproject develops the capability for providing an interactive,
computer-based tactical simulation training system to provide realistic
Battle Group Level training for senior Naval officers in force-level tactical
decision making, operational planning, and Command and Control. Earlier in
this Project, an interim Battle Group Tactical Trainer was developed and
evaluated by the Naval Ocean Systems Center (NOSC). As a result, a decision
was made by the Chief of Naval Operations (CNO) to enhance the previously
developed War Gaming System at the Naval War College to provide this
training. This is the only device of this type that gives the Navy the
capability to provide comprehensive training in battle group level tactical
decision making. This Subproject becomes active in FY 85 and will continue
development of software and hardware.

PAYOFF/UTILIZATION:

The payoffs for this Project include: (a) improved training effectiveness,
(b) improved training device requirements, selection, assignment, and
utilization effectiveness, (c) reduced training costs, and (d) enhanced
operational performance.

PROGRAM ELEMENT OVERVIEW

PE: 64714N   AIR WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: FY84 $11.6M (FY85 PRESIDENT'S BUDGET)
                               FY85 $ 3.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide for prototype development
and procurement of air weapons training systems to satisfy the training
requirements established by the Chief of Naval Operations and Fleet
Commanders.

Projects under this Program Element will develop and procure: (a) an
Operational Flight Trainer which offers safe flight training, lower training
time, and lower capital investment in operational aircraft used for training,
(b) a Weapons Tactics Trainer for mission training of the air tactical
officer and the sensor operator, and (c) a full set of maintenance trainers
to teach troubleshooting and repair of the aircraft.

In FY 84, funding is required to complete trainers in time to meet the SH-60B
Helicopter operational requirements. In FY 85, funding is needed to
incorporate baseline changes into the trainers which were in the production
aircraft but were not funded as a part of the original trainer baseline
because of funding deficiencies.

PAYOFF/UTILIZATION:

The payoffs for this Program Element include: (a) improved training of
personnel on new weapon systems, (b) improved tactical, team, and crew
training in single and multi-system situations in threat environments, and 3)
integration of new system developments in weapon system training.

These improvements in training will enhance the proficiency and readiness of
Navy personnel in their individual and crew duties in total operation and
maintenance of the weapons systems.

FUTURE DIRECTIONS:

The future direction of this Program Element will be to continue to meet the
requirements of the Chief of Naval Operations and Fleet Commanders for
development and initial procurement of various air warfare training devices.

PROJECT OVERVIEW

		84	85
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PROJECT: W1112	SH-60B TRAINERS	$11.6M	$ 3.1M

PE: 64714N   AIR WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL AIR SYSTEMS COMMAND

PROJECT SYNOPSIS:

The objective of this Project is to develop: (a) a weapon tactics trainer for
weapon system training for aircrew teams to perform successful Anti-Submarine
Warfare/Anti-Ship Surveillance and Targeting (ASW/ASST) missions, (b) an
operational flight trainer for training the pilot and copilot in the
operation and performance envelope of the SH-60B, and (c) a set of
maintenance trainers for organizational level maintenance training.

These trainers will be developed and procured as required by LAMPS MK III
Navy Training Plan A50-7702 (Aircraft Subsystem). This equipment is needed to
establish an in-house training capability for the LAMPS MK III Weapon System.

In FY 84, it is planned to: (a) complete technical manual validations and
site installation of an avionics trainer for the Naval Air Maintenance
Trainers, (b) verify and inspect all trainers on-site, (c) provide
engineering services, repair of repairables, installation of repairables,
installation of retrofit kits, and final checkout, (d) complete on-site
acceptance and instructor training for the Operational Flight Trainer, (e)
initiate design for trainer update, (f) complete in-plant tests, site
installation, instructor and maintenance training for the Weapon Tactics
Trainer, (g) supply support and technical manuals, and (h) initiate design
for trainer update to aircraft configurations.

In FY 85, it is planned to complete updated design incorporation and
acceptance of updates into trainers and final Technical Manuals. This Project
will be completed in FY 85.

PAYOFF/UTILIZATION:

The payoffs for this Project include: (a) benefits to the Navy by increasing
the proficiency of personnel who operate and maintain these weapon systems,
and (b) faster and safer flight training and lower costs for operational
aircraft used in flight training.

PROGRAM ELEMENT OVERVIEW

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: FY84 $27.1M (FY85 PRESIDENT'S BUDGET)
                              FY85 $32.2M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to support the Chief of Naval
Operations Surface Warfare Sponsor (OP-03) mission by improving readiness and
training.

This Program Element was developed to satisfy the requirements of the Fleet
and the Chief of Naval Education and Training for development of prototype
surface warfare training devices to provide improved training thereby
improving operational readiness, efficiency, and safety while decreasing
training time and cost. Specifically, this Program Element supports the
development of those prototype surface warfare training devices which are not
developed as part of a parent weapon system development process or not
characterized by emerging training device technology (and therefore included
within PE 64703N, Training Device Prototype Development).

Program Element 64715N has four general areas of effort: (1) operator/team
trainers in the area of electronic/acoustic surveillance in ASW
(Anti-Submarine Warfare) operations for existing or planned operational
equipment, (2) maintenance trainers for a variety of electronic/acoustic
devices and trainers in the operation of engine room equipment for existing
and new development engineering equipment, (3) modification, update,
consolidation, or replacement of existing training devices, and (4) other
training problem areas which can benefit by the use of stimulation/simulation
training device techniques.

In FY 84, various efforts under this Program Element include: (a) Initial
Operational Capability (IOC) scheduled for the FFG-7 Pierside Combat Team
Trainer, (b) scheduled Navy Support Date for the Naval Tactical Data System
Laboratory, (c) completion of Device 14E18/14E25/14E25A Modifications, (d)
completion of prototype fabrication of LAMPS MK III/SQQ-89 Training System,
(e) Navy Acceptance scheduled for OUTBOARD/Team Trainer, (f) completion of
fabrication of AN/SQR-18A Sonar Operator/Team Trainer, (g) completion of
fabrication of the Phase I prototype Universal SQQ Sonar Maintenance Trainer,
and (h) completion of development testing of the Shipboard Training system.

In FY 85, it is planned to: (a) complete the prototype device and schedule
the Navy Support Date for the FFG-7 Pierside Combat System Trainer, (b)
achieve IOC for the LAMPS MK III/SQQ-89 Training System, (c) continue design,
fabrication, assembly, and monitoring for Tactical Advanced Combat Direction
Electronic Warfare Modifications, (d) achieve IOC for the Universal/SQQ-89
Sonar Maintenance Trainer, Phase I, and complete fabrication efforts on Phase
II, (e) begin fabrication of the Surface Tactical Trainer, Device 14A12, and
(f) begin fabrication of the prototype TERRIER New Threat Upgrade Team
Trainer.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) reduced training costs, (b) safer training conditions, and (c) enhanced operational readiness.

The high cost of operational training exercises at sea continues to make it imperative to develop, improve, and extensively use alternative shipboard methods for individual and team training. Although they are complex and continuously evolving, these training systems will provide realistic training at a fraction of the cost of the same training at sea, and they also expose the trainees to a broad range of scenarios that could not be carried out in live situations. The end product is an enhancement of operational readiness.

FUTURE DIRECTIONS:

The future directions of this Program Element include: (a) beginning development of engineering specification for the Surface TOMAHAWK Trainer in FY 86, (b) inclusion of the FFG-36 and DD-963 class ships in the Pierside Combat System Team Trainer effort, (c) completion of the LAMPS MK III/SQQ-89 Training System, with Navy Support Date scheduled in February 1986, (d) Development Testing of Tactical Advanced Combat Direction Electronic Warfare Modifications in December 1986 through February 1988, (e) Trainer Capability Testing for the Universal/SQQ-89 Sonar Maintenance Trainer, Phase I, in December 1986, (f) achievement of IOC for the Air Intercept/Anti-Submarine Air Controller/Air Tactical Control Operator, (g) completion of fabrication of the TERRIER New Threat Upgrade Team Trainer in June 1987, and (h) completion of fabrication of the Landing Craft Air Cushion Operator Trainer in October 1987.

PROJECT OVERVIEW

		84	85
PROJECT: Z1126	SURFACE TOMAHAWK TRAINER	$ 1.0M	$ 0.0M
PE: 64715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to provide training for the TOMAHAWK Combat Weapon System through development of the surface TOMAHAWK trainer.

The trainer will simulate the tactical environment of Surface Ship System Targeting, the pre-setting and launching operations for both the anti-ship and land attack configuration TOMAHAWK missiles, and the anti-ship HARPOON missile. In both, the stand-alone and joint-task modes for training and the pseudo-threat situation will be presented to the trainee through simulation of onboard sensors, targeting, and tactical commands. The TOMAHAWK trainer will stimulate operational TOMAHAWK Common Weapon Control System equipment and consoles to provide individual and team training. It will be installed in one Naval Tactical Data System mockup at the Tactical Advanced Combat Direction System and Electronic Warfare (TACDEW) Pacific and in two Naval Tactical Data System mockups at the Tactical Advanced Combat Direction System and Electronic Warfare Atlantic. The trainer will provide individual operator training and team training when integrated with these systems.

The Surface TOMAHAWK Trainer will be designed to provide the TACDEW complex with a surface training capability for the ship-launched version of the TOMAHAWK missile in both the anti-ship and land attack versions. Full integration into the TACDEW Monitor simulation will be accomplished by permitting single and multi-fleet scenario training for initial and replacement personnel for TOMAHAWK-capable ships.

In FY 84 and FY 85, this Project will continue to monitor development of the operational equipment.

PAYOFF/UTILIZATION:

The payoffs of this Project are as follows: (a) the TOMAHAWK Combat Weapon System Trainer will be deployed on DD-963, CG-26, and CGN class ships to provide these ships with a primary offensive system, to engage both surface ships and selected land targets as described in Naval Training Plan M-30-7718-D, (b) installation of the TOMAHAWK Combat Weapon System-Surface will provide an integrated TOMAHAWK and HARPOON Weapon Control System, and (c) replacement of the HARPOON Weapon Control Console with the OM-914-V4 display console will provide the capability to perform control, selection, and monitoring of all possible configurations of missile initialization and firing for both TOMAHAWK and HARPOON.

PROJECT OVERVIEW

	84	85
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PROJECT: Z1127 FFG-7 PIERSIDE COMBAT SYSTEM TEAM TRAINER	$ 0.5M	$ 0.4M

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to provide refresher and replacement crew Anti-Submarine Warfare, Anti-Air Warfare, Surface Warfare and multi-threat team training for FFG-7 class combat system personnel.

The FFG-7 Pierside Combat System Team Trainer will utilize the ship and installed operational equipment as trainee stations. External environment, target/weapon signals, and dynamic scenario generation will be developed within the trailerized (pierside) computational system. Appropriate target signals will be transmitted to the ship for simulation of on-board operational equipment. Weapon signals and other selected data will be returned to the computer to permit problem evaluation.

Through the development of new equipment, the combat system highly automates the interactions between the ship's sensors, tactical data processing displays, and on-board weapon systems so that incoming unfriendly threats may be effectively defeated. The unique characteristics of this combat system will require modification to traditional tactical doctrine and will impose unusual demands upon the human-machine interface in order to reduce threat reaction time to an absolute minimum. The net result of these factors is a need for a training system capable of providing proficiency team training for combat personnel in a multi-threat, multi-ship environment representative of the surface Fleet of the 1980s.

In FY 84, the development test and evaluation will be completed in March, and the Initial Operational Capability is scheduled for April.

In FY 85, the prototype device will be completed with the Navy Support Date scheduled for April.

PAYOFF/UTILIZATION:

The payoff of this Project is improved refresher and replacement crew Anti-Submarine Warfare, Anti-Air Warfare, Surface Warfare, and multi-threat team training for FFG-7 class combat system personnel.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1130	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY	$ 0.2M	$ 0.0M
PE: 64715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to develop a training support laboratory to support Naval Tactical Data System (NTDS) console operator training.

Fleet demand for personnel qualified in NTDS console operation skills will continue to increase as the Navy converts from conventional to NTDS-capable ships. The Operations Specialist (OS) Class "A" school is being relocated to FLECOMBATRACENLANT, Dam Neck, VA. Training in operator skills must be supported in both Input Operator mode and User mode of NTDS operation.

The Project will develop a training support laboratory to support training for both Input Operator and User Operator. The Laboratory will provide dynamic training in the visual and tactile responses required for personnel to acquire the NTDS console manipulative and interpretive skills in order to qualify as NTDS operators. Emphasis in the development effort will be training support for Input Operator training. Preprogrammed training scenarios will be provided to support the projected 60 hours of hands-on training required for Input Operator. User Operator requirements may be supported by development of the software and scenarios appropriate to the various User mode objectives. The Laboratory will include a Master Suite capable of generating training scenarios so the using activity can modify existing scenarios or generate new scenarios for weather Input or User Operator requirements.

In FY 84, this Project consists of complete training capability testing in December 1983 and a scheduled Navy Support date for February 1984. The Project completes in FY 84.

PAYOFF/UTILIZATION:

The payoff of this Project is that the NTDS Laboratory will support the growing demand for personnel qualified in NTDS consol operation as well as an increasing requirement for team, refresher, and transition training.

The NTDS Laboratory will consist of a complex of equipment designed to simulate the functions of OJ-194 NTDS console operation for dynamic training in NTDS operator skills and techniques. The Laboratory includes 64 trainee positions (simulated OJ-194 consoles) in multiples of 4 consoles per trainee suite. Each suite will be activated and controlled by a mini-computer and associated peripherals. Scenario and computer software development to support the projected 60 hour NTDS Basic Input Operator syllabus are included in the cost estimate, as are support equipment, onboard repair parts and supply support costs.

The Laboratory will be installed in designated space in Building 110,

FLECOMBATRACENLANT, Dam Neck. In terms of training benefit, the Laboratory will support achievement of 99.9 percent of the training objectives required for NTDS Input Operator qualification and is capable of supporting the volume of training load projected for Operator training.

In FY 83, developmental test and evaluation of the prototype fabricated in FY 82 was completed and initial operational capability was achieved.

PROJECT OVERVIEW

	84	85
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PROJECT: Z1131   DEVICE $ 0.8M $ 0.0M
14E19/14E25/14E25A
MODIFICATIONS

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) update and modify the 14E19, 14E25, and 14E25A devices to provide an effective means of training and maintaining the proficiency of AN/SQS-26CX and AN/SQS-53/53A sonar operators and their Anti-Submarine Warfare (ASW) teams, and (b) respond to the impact of the Quick Reaction Fleet Improvement Program, which is an ongoing program to modify the AN/SQS-26CX and AN/SQS-53/53A sonars and change their capabilities, thus requiring additional modification of their training simulators.

There are currently eight 14E19's (AN/SQS-26CX sonar simulator) and two 14E25/25A's (AN/SQS-53/53A sonar simulator) in use plus one 14E25A under procurement. Though used extensively for training over many years, Devices 14E19, 14E25, and 14E25A have been criticized by the using activities for lack of realism, i.e., the capabilities and display features of these devices do not match those of the operational sonars they represent, so their training effectiveness is limited. Additionally, users have experienced reliability and maintainability problems with these devices.

In FY 84, this Project consists of: (a) conducting Training Capability Testing in March, and (b) attainment of Navy Support Date. The Project completes in FY 84.

PAYOFF/UTILIZATION:

The objective of this Project is to improve anti-submarine operational readiness resulting in less time required for at-sea training.

This effort will provide for analysis of the training objectives of the users, the characteristics of the updated AN/SQS-26CX and AN/SQS-53 operational equipment, and the reliability and maintainability and support situation associated with the existing devices.

In FY 83, development testing of the prototype begun in FY 82 was completed. Initial Operational Capability was achieved in September 1983.

PROJECT OVERVIEW

		84	85
PROJECT: Z1132	LAMPS MK III/SQQ-89 TRAINING SYSTEMS	$ 6.3M	$ 4.8M

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop a training system for the LAMPS
MK III/SQQ-89 Multi-Sensor Anit-Submarine Warfare (ASW) system on FFG/DD/DG
ship classes.

The system will consist of selected components of the shipboard operational
SQQ-28, SQR-19, and SQS-53B/C sensor equipments, simulation/stimulation
equipments, a simulation computer and appropriate instructional control
capabilities. The training system will support operator training on the
individual sensor systems as well as data acquisition/interpretation and
utilization in tactical combat exercises. The system must provide for each
phase of the operator's skill/knowledge development as well as providing
sonar team training.

The proposed trainer will be integrated with the Tactical Advanced Combat
Direction and Electronic Warfare (TACDEW) trainer. In the TACDEW installation
the trainer will interact with the operational program and with Tactical Data
System display/control consoles in selected mockups and with the TACDEW
environment generation and exercise control systems through a satellite
buffer computer. When integrated with the TACDEW complex, the trainer will
support coordinated combat system team training in applications of the
extended range anti-submarine warfare mission of the LAMPS III system and the
integrated SQQ-89 system.

In FY 84, this Project consists of: (a) awarding a production contract for
follow-on units, and (b) completion of prototype fabrication.

In FY 85, it is planned to conduct developmental testing and achieve Initial
Operational Capability in February 1985.

PAYOFF/UTILIZATION:

The payoff for this Project is that the trainer will support operator
training for the SQQ-28, SQR-19 and SQS-53B/C, which make up the SQQ-89.

The training system will support operator training on the individual systems
as well as team training when integrated with the TACDEW trainer. It will
also support operator and combat system team training in operation,
utilization, and tactical application in the ASW mode of the system.

PROJECT OVERVIEW

		84	85
PROJECT: Z1134	OUTBOARD OPERATOR/TEAM TRAINER	$ 0.3M	$ 0.0M
PE: 64715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to support team training for teams on selected surface ships that will be receiving new systems designated OUTBOARD to assist in the task of detection, identification, and tracking of non-radar targets which are a threat to the force.

Team members must be qualified and trained as individuals and as members of the whole team. Team members need to practice together until their actions are as automatic as the equipment they operate. Then they must practice with other Navy teams - CIC (Combat Information Center) teams aboard their ships, CIC teams in the Group, land sites, etc. It is important for teams to practice tactical actions in a realistically-simulated threat environment (with hostile signals, overt actions, and expected and unexpected tactical actions). OUTBOARD Teams will learn to master their intercept, transmitting, measuring, recording, peripheral equipment, and proper communication procedures (both intra- and inter-ship) in an environment which accurately represents that found in their shipboard duty station.

Integrated into the Tactical Advanced Combat Direction and Electronic Warfare (TACDEW) complex, the OUTBOARD/Operator Trainer will support team training for the OUTBOARD team operating in a simulated tactical environment with the combat system team. The trainer will include operationally equivalent operator consoles for the following six trainee positions: System Supervisor, Direction Finding Operator, High-Frequency and Very-High Frequency Operators (3), and Caliper Operator.

In FY 84, this Project consists of conducting trainer capability testing with Navy Acceptance scheduled in June.

In FY 85 and FY 86, this Project is unfunded.

PAYOFF/UTILIZATION:

The payoff of this Project is development of a team trainer for systems designated OUTBOARD by which teams can learn to operate in situations normally found only in combat.

When fully developed, the OUTBOARD team trainer will be a mockup of an operationally equivalent system located at the Fleet Combat Training Center (FLECOMBATRACEN), Pacific, as an integral part of the TACDEW trainer. Within this mockup, assigned OUTBOARD teams from ships in the San Diego area can practice and receive training in an accurately simulated electronic hostile environment. When integrated with the whole of the FLECOMBATRACEN TACDEW trainer, the OUTBOARD trainer will appear to be located aboard one ship within a force of several ships and many friendly and/or hostile targets, all

under controlled supervision for evaluation. All ships and targets are under
positive control and will act/react realistically. Training scenarios will be
developed to maximize team training by compressing actions into a shorter
time, to tax trainees and systems to their limits and to create problems and
confusions which will require extra efforts. Meanwhile, TACDEW personnel will
analyze the actions of teams and individuals to determine strengths and
weaknesses, to determine what needs to be done to overcome weaknesses, and to
devise methods to correct inadequacies within the safe confines of the
facility.

In FY 83, fabrication was completed (May) and Initial Operational Capability
was achieved (June).

PROJECT OVERVIEW

	84	85
PROJECT: Z1140 TACTICAL ADVANCED COMBAT	$ 0.4M	$ 2.0M

PROJECT: Z1140   TACTICAL ADVANCED COMBAT $ 0.4M $ 2.0M
DIRECTION ELECTRONIC
WARFARE (TACDEW)
MODIFICATIONS

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to achieve a progressive redesign of the
environment generation/control system and control systems of the Tactical
Advanced Combat Direction and Electronic Warfare (TACDEW) device.

The Tactical Advanced Combat Direction System and Electronic Warfare training
complexes located at Fleet Combat Training Centers Atlantic and Pacific are a
vital link in the training chain for integrated combat system team training.
The TACDEW system provides a potentially powerful, flexible tool to support
Combat System Operational Training (CSOT). Since 1967, when both systems
became operational, many add-on capabilities have been incorporated, and
frequent changes have been made to the Master Simulation Program (MSP) (which
controls environment generation) to stay current with Fleet training
requirements. The obsolescent computer system and the architecture of the MSP
severely inhibit continued ability to integrate new operational equipment or
weapon system capabilities. Potential for further growth is negligible in the
present configuration. The Navy Training Plan process has identified new
combat system capabilities which need to be integrated, thus mandating a
total system redesign to support initial qualification and/or replacement
training in combat system operation, utilization, and application for
shipboard combat personnel.

The objective of the TACDEW Modification Program is to achieve and maintain
capabilities within the TACDEW environment generation and control system
which will support identifiable CSOT requirements through 1995. The modified
TACDEW system will support combat system team operational training at all
required levels, including individual operator, combat system subteam (ship
subsystem) and full combat system team. The system will be capable of
presenting training situations ranging in complexity from single ship/single
threat to multiple threat conditions.

In FY 84 and FY 85, the program consists of continued design development,
fabrication, and monitoring.

PAYOFF/UTILIZATION:

The payoff of this Project is a progressive redesign of the environment
generation and control system of the TACDEW device. This will ensure the
ability for further growth to accommodate training for emerging combat system
capabilities identified through the Navy Training Plan process.

In FY 83, development of the prototype design was begun.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1268   AN/SQR-18A SONAR $ 1.7M $ 0.0M
                        OPERATOR/TEAM TRAINER

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop a training device which will
generate signals simulating those received by the AN/SQR-18A Tactical Towed
Array Sonar under a variety of environmental conditions and modes of array
operation.

The device will be capable of operating independently to provide operator
training or jointly with 14E(Series) Devices to provide sonar team training
and Anti-Submarine Warfare (ASW) team training. The trainer will provide
valid situations for Sonar Technicians, Surface (STS) to learn and practice
the activities, procedures and skills needed to detect, classify, and track
various target types and ambient noises within changing environmental
conditions with various modes of array operation. The trainer will include
the capability to be integrated with Device 14A2 (Surface Ship ASW Attack
Trainer) to train and improve the proficiency of teams such as surface ship
attack teams in the operation of ASW weapons systems and tactical procedures.
The trainer software will provide for programming, designating, setting and
changing SQR-18A parameters, characteristics and values. These are
appropriate for developing and conducting both independent operator training
or ASW attack team training with realistically representative operational
scenarios and situations.

The trainer will show trainees visual and auditory sonar representations of
submarine targets, including all the effects normally displayed at the
SQR-18A consoles. Target size, aspect, position, wake, turns, and dopple must
be accounted for. Other effects, such as target-radiated noise, noises made
by undersea life, and reverberations and distortions produced by
hydro-acoustic phenomena and bottom characteristics will be included in the
acoustic simulation repertoire. The equipment should generate vehicle motion
and position, and control the timing, intensity, and deflection of video and
audio, depending on sonar operator manipulations of SQR-18A controls.

In FY 84, this Project will consist of completion of fabrication and
development testing of the prototype. After test and acceptance of the
prototype, fabrication of the follow-on trainer will begin and additional
target capability will be provided to the prototype. In addition, the RDT&E
(Research and Development Test & Evaluation) will be completed.

PAYOFF/UTILIZATION:

The payoff of this Project is the development of a trainer which will
generate signals simulating those received by the AN/SQR-18A Tactical Towed
Array Sonar.

When fully developed, the trainer will be installed at the Fleet ASW Training

Center Atlantic (FLEASWTRACENLANT), Norfolk. Primary use of the trainer will
be for refresher and proficiency training for Fleet crews. When used as a
trainer for Fleet crews, the entire ASW team from a ship will be involved.
Training will be scheduled for 2-3 days or longer. Beginning sessions will be
30-45 minute scenarios increasing to 2-4 hours or longer. Instructors who are
qualified as SQR-18A instructors will be members of the ASW instructional
staff.

PROJECT OVERVIEW

		84	85
PROJECT: Z1270	UNIVERSAL/SQQ-89 SONAR MAINTENANCE TRAINER	$ 5.7M	$ 5.9M

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop a training system to teach sonar maintenance for the SQQ-89 multi-sensor system aboard FFG-7 and DD-963/CG-47 class ships.

The SQQ-89 Sonar Maintenance Training System developed under this project will provide basic and advanced diagnostic training for Level I and Level II sonar maintenance personnel. The system will accommodate common equipment, basic diagnostic, and system-specific (SQR-19, SQQ-28, and SQS-58B/C) training. The development will provide all hardware, software, and courseware to support the training requirements.

The SQQ-89 multisensor system is designed to provide improved detection, classification, localization, and tracking capabilities in both active and passive modes against threat submarines and over-the-horizon ships. The first part of the maintenance training system will provide a common equipment trainer which consists of 14 student stations (using 2D/3D interactive panels), associated software development, and support. The trainer suite will provide diagnostic training for sonar operators and will locate faults in digital processing equipment. It is comprised of selected parts of shipboard operational equipment, simulation/stimulation equipments, a simulation computer, and appropriate instructional control capabilities.

The FY 84 program consists of: (a) awarding the contract for Phase II in December, and (b) completing fabrication efforts on the Phase I prototype in April.

In FY 85, it is planned to: (a) conduct Development Testing for Phase I in May and June, (b) achieve Initial Operational Capability (IOC) for Phase I, and (c) complete fabrication efforts on Phase II.

PAYOFF/UTILIZATION:

The payoff of this Project is increased skill of sonar maintenance personnel, contributing to the improved operational readiness of the SQQ-28, SQR-19, and SQS-58B/C sensor systems.

PROJECT OVERVIEW

		84	85
PROJECT: Z1274	AIR INTERCEPT/ANTI-SUBMARINE AIR CONTROLLER TRAINER	$ 2.9M	$ 4.9M

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop a training system that will teach the Air Intercept Controller (AIC)/Anti-Submarine Air Controller (ASAC) and Air Tactical Control Operator positions on CGN/FFG class su. ps.

The system will be comprised of two individual stand-alone trainers: Air Intercept Controller/Anti-Submarine Air Controller, Device 20F19, and Air Tactical Control Operator, Device 20F18. The Air Intercept Controller/Anti-Submarine Air Controller trainer will teach students the procedures associated with the control of: (a) fighter aircraft employed as Combat Air Patrol during air intercept operations, and (b) Anti-Submarine Warfare (ASW) aircraft and helicopters while enroute to and departing from the operation area and while prosecuting a potential submarine contact.

The Air Tactical Control Operator trainer will teach students the procedures associated with the control of the LAMPS (Light Airborne Multi-Purpose System) MK III helicopter in executing both the ASW and Anti-Ship Surveillance Targeting missions.

There is an increasing need to train AIC and ASAC personnel because more LAMPS are being added to the Fleet, more ships are converting to NTDS (Naval Tactical Data Systems), and fighter aircraft are increasing their use of data linkage. There is also a continuing need to requalify and maintain the proficiency of personnel.

In FY 84, this Project consists of: (a) continued fabrication of Air Intercept Controller/Anti-Submarine Air Controller and Air Tactical Control Operator trainers, and (b) contract award for the Air Tactical Control Operator trainer.

In FY 85, it is planned to continue development and fabrication of both trainers through completion in September.

PAYOFF/UTILIZATION:

The payoff of this Project is enhanced training for Air Intercept Controller/Anti-Submarine Air Controller and Air Tactical Control Operator personnel.

In addition to the generation of simulated environments, this trainer will support training by using live radar and IFF (Identification Friend or Foe) inputs.

In FY 83, a contract for the Air Intercept Controller/Anti-Submarine Air

Controller and Air Tactical Control Operator trainer was awarded (June) and fabrication was begun.

PROJECT OVERVIEW

		84	85
PROJECT: Z1427	SURFACE TACTICAL TRAINERS	$ 3.1M	$ 5.9M
PE: 64715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to develop a generic training system which will replace obsolete/obsolescent devices to provide team procedural and tactical training/evaluation in a multi-threat environment for conventional and tactical data-equipped ships.

The first device to be developed, Device 14A12, will replace the obsolete 14A2 Devices currently used to provide Anti-Submarine Warfare (ASW) team training. The 14A12 will have the capability to exercise the essential procedures of an ASW engagement and will simulate current and future emerging passive and active sensors operating in a common ocean model. A natural progression of Device 14A12, Device 20A66, is planned to replace the ASW Coordinated Tactics Trainers, Devices X14A6 and 14A6A, built in the 1980s. The 20A66 trainer will provide multiple platform/multi-threat procedural, tactical, and decision-making training for single units up to battle group size. Each trainer will be composed of multiple ship, submarine, and aircraft "command centers" configured with multi-purpose equipments which will simulate the sensor, weapon, and communication capabilities of the platforms represented. The last trainer in the system, the Tactical Action Officer (TAO) Device, is a decision-making trainer for prospective department heads, executive officers, commanding officers, and tactical action officers.

In FY 85, it is planned to: (a) continue design of the 14A12 with a Design Review in May, (b) commence fabrication in June, and (c) develop a functional baseline for 20A66, leading to contract award in FY 86.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) enhanced skill and proficiency of ASW ship crews, and (b) enhanced combat readiness of the Fleet.

The Surface Tactical Trainers will simulate the operational environment, providing realistic operator and team training for multi-sensor ASW ship personnel. The new trainers are required because the older 14A2s, developed in the early 80s, are unable to train operators on newer ship sonar system equipment and cannot be adequately upgraded or modified in a cost-effective way.

PROJECT OVERVIEW

		84	85
PROJECT: Z1434	SHIPBOARD "ORGANIC" COMBAT SYSTEM TEAM TRAINER (SOCSTT)	$ 1.0M	$ 0.4M
PE: 64715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to respond to a CNO letter Ser 03/212282 of 12 December 1977 which identified the need for both pierside and Shipboard Organic Combat System Team Training (SOCSTT) to support the spectrum of combat systems team training.

SOCSTT is defined as a combat system operator/team training system that is embedded through the use of microcomputers and distributed processing techniques into operational systems. The prototype pierside trainer began development in December 1980 (Project Z1127). Further evolution of the "on-board" concept is necessary to develop the required "organic" combat systems team training capability within surface combatants not yet designed.

In FY 84, work on the Project consists of: (a) determining functional baseline and technology requirements for the "organic" embedded training system, (b) continued support of COMNAVSEASYSCOM (Commander Naval Sea Systems Command) training, testing, and performance measurement, and (c) continued evaluation of existing organic training to determine applicability to the requirements.

In FY 85, it is planned to continue support of NAVSEASYSCOM in development of Training, Testing, and Performance Measurement systems developed for various ship classes.

PAYOFF/UTILIZATION:

The payoff of this Project is that it meets an urgent need to develop an embedded organic training system in surface combatants to operate independently of other training systems and also to be able to interact with and complement those systems (e.g., the FFG-7 Pierside Trainer).

The FFG-7 Pierside Trainer will be used to train all crew members involved with the combatants' weapons systems by conducting independent, single-ship combat training at sea during Condition III and V operations and at pierside.

The organic training system stimulates operational equipments to present realistic multi-threat scenarios encountered in the full spectrum of three-dimensional surface warfare. It also stimulates selected subsystems and allows data extraction for performance monitoring. The system interfaces with other elements of the combat system so that proficiency training can be conducted at the operator, subteam, and tactical decision-maker levels.

In FY 83, draft military standards for future organic training capability were completed, and analysis of backfitting organic capability into existing

systems was continued for the DD-963 and other ship classes.

PROJECT OVERVIEW

		84	85

PROJECT: Z1435   SHIPHANDLING TRAINING $ 0.1M $ 0.0M
SYSTEM

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop a Part-Task Ship/Piloting
training system consisting of an array of training equipment, including
training aids and part-task trainers.

The U.S. Navy is experiencing increasing incidents or near-incidents of
collisions, groundings, and generally substandard shiphandling. This is
directly related to the decreasing tempo of Fleet operations. Past and
current practice is to provide shiphandling experience for junior officers
while underway. With at-sea operating periods greatly reduced, trainees have
fewer adequate shiphandling training opportunities.

The training aids will be audio-visual presentations of prescribed maneuvers
which permit limited-to-no student interaction. Low-cost part-task trainers
incorporating modern simulation and instructional technology features will
include radar navigation, collision avoidance, and hydrodynamics/inertial
effects trainers. The part-task trainers/aids will be designed to support the
instruction of principles/rules, concepts and problem solving at the basic
student level, and refresher training for intermediate course levels. The
training aids will be designed to support shiphandling problem solving at
intermediate and advanced course levels for conning officers' training.

Ongoing analysis efforts will identify and define in detail the specific
training equipment and curriculum needed to provide the training.

In FY 84, Project efforts include: (a) complete development/fabrication of
initial part-task trainers, and (b) complete developmental testing in June
1984. The Project will be completed in FY 84.

PAYOFF/UTILIZATION:

The payoff for this Project is improved Ship/Piloting training through the
development of a Ship/Piloting training system.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1436	SURFACE WARFARE TRAINING ANALYSIS	$ 0.8M	$ 0.8M
PE: 84715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to conduct front-end analysis of specific training problems to include definition of requirements/shortfalls, training objectives, and student loading, and to identify alternative solutions with related cost/training effectiveness trade-offs.

The HARDMAN study continues to develop training requirements for the Surface Warfare Community by analyzing and identifying present and future training needs and manpower requirements for major system acquisitions. To respond to those requirements, individually tailored, detailed trainer/training systems selection procedures must be developed.

Instructional System Development (ISD) analysis methods are used to produce an appropriate functional specification for each trainer/training system. Some of these analyses are: (a) determination of specific training objectives, (b) determination of alternative solutions to the training needs/requirements, and (c) cost/training effectiveness studies. This effort extends beyond the HARDMAN program since functional specifications must be developed and tailored to individual training systems/devices before contracts are awarded. This front-end analysis effort includes those parts of the ISD methods used: (a) to tailor the device or system to specific training objectives, (b) to ensure inclusion of latest technology, and (c) to avoid "gold plating" by cost/training effectiveness trade-offs. Thus, the individual elements of the specific training system will most effectively reflect the requirements and needs identified by the HARDMAN program.

In FY 84, this program will continue training analysis and Instructional System Development support.

In FY 85, it is planned to continue similar work as in previous years.

PAYOFF/UTILIZATION:

The payoff of this Project is the provision of a continuous program to analyze specific surface warfare training problems and areas.

The results of these analyses will provide functional specifications for particular training devices or training systems. These results will be made available to activities that will procure the designated training package. Also, alternative and cost/training effectiveness analyses will be provided to appropriate activities to help decision making. The end product will be cost/training effectiveness systems tailored to specific training requirements.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1605	TERRIER NEW THREAT UPGRADE TEAM TRAINER	$ 2.6M	$ 4.6M
PE: 84715N	SURFACE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to fund the development of a TERRIER New
Threat Upgrade Team Trainer.

The current design of the Tactical Advanced Combat Direction System and
Electronic Warfare (TACDEW) complexes cannot support Terrier New Threat
Upgrade training. This Project will alleviate this problem by funding the
development of a Terrier New Threat Upgrade Team Trainer. When developed, the
new trainer will be integrated into existing TACDEW complexes. It will
provide a means for dynamic team training in skills essential to qualify and
increase the proficiency of enlisted ratings assigned to Combat Information
Centers (CICs) and Weapons Officers in the operation and operational
employment of the Terrier New Threat Upgrade System in a multi-unit,
multi-threat environment.

The training device will consist of a simulation computer with necessary
software, a video simulator, and interface equipment between the simulator
and the operational equipment. The simulation computer will simulate all the
sensors and systems which interface with the MK-14 operational equipment and
the AN/SQS-(CG)IADT system. The simulation equipment will accept target
information from the TACDEW Master Simulation System (MSS) for support of
team training exercises and will supply SM-2(ER) positional data to the MSS.

In FY 84, work on this Project consists of developing functional descriptions
and engineering, and preparing procurement packages.

In FY 85, it is planned to: (a) award a contract in December, (b) continue
design development through to the Design Review scheduled in June and, (c)
commence fabrication of the prototype.

PAYOFF/UTILIZATION:

The payoff of this Project is a new trainer that will benefit the Fleet by
training and qualifying operators in skills essential for the operation and
use of the Terrier New Threat Upgrade System in a multi-threat, multi-unit
environment.

PROJECT OVERVIEW

		84	85
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PROJECT: Z1834	LANDING CRAFT AIR CUSHION OPERATOR TRAINER	$ 0.0M	$ 2.5M

PE: 64715N   SURFACE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

RESPONSIBLE ORGANIZATION: NAVAL TRAINING EQUIPMENT CENTER

PROJECT SYNOPSIS:

The objective of this Project is to develop an Air Cushion Vehicle Operator Training System for personnel assigned to Landing Craft, Air Cushion Vehicles.

The system developed under this funding line will include a Full Mission Trainer and a Mid-Level Part-task Trainer. The Full Mission Trainer will have a motion base and visual system with interactive controls for individual and team training for the Operator, Assistant Operator/Engineer, and Navigator. The Mid-Level Part-Task Trainer with visual system and interactive controls will teach underway operational procedures to the Operator and Assistant Operator/Engineer.

In FY 84, this program consists of: (a) continued analysis efforts and preparation of functional descriptions, and (b) preparation of procurement documentation.

In FY 85, it is planned to: (a) award the contract in December, (b) schedule the Design Review in June, and (c) begin fabrication after successful Design Review.

PAYOFF/UTILIZATION:

The payoff of this Project will be the development of an Air Cushion Vehicle Operator Training System for personnel assigned to Landing Craft, Air Cushion Vehicles.

PROGRAM ELEMENT OVERVIEW

PE: 64716N   SUBMARINE WARFARE TRAINING DEVICES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

FUNDING: FY84 $ 0.6M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 0.5M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to satisfy requirements of the Fleet
and the Chief of Naval Education and Training for development of prototype
submarine warfare training devices.

This Program Element was established in FY 79-80 for the specific purpose of
handling the procurement of submarine combat training equipment. The use of
distinctive Project designations for procurements enhances the accountability
and the establishment of realistic procurement priorities.

In FY 84, it is planned to award the contract for the prototype Gas
Management System Trainer.

In FY 85, fabrication will continue to completion in July.

PAYOFF/UTILIZATION:

The payoffs for this Program Element include: (a) improved operational
readiness and efficiency, (b) improved training safety, and (c) decreased
training time and cost.

FUTURE DIRECTIONS:

Future directions for this Program Element include a scheduled Final Navy
Support Date for the Gas Management System Trainer in December 1986.

PROJECT OVERVIEW

		84	85
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PROJECT: S1735	GAS MANAGEMENT SYSTEM TRAINER	$ 0.6M	$ 0.5M
PE: 64718N	SUBMARINE WARFARE TRAINING DEVICES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	NAVY		
RESPONSIBLE ORGANIZATION:	NAVAL TRAINING EQUIPMENT CENTER		

PROJECT SYNOPSIS:

The objective of this Project is to develop a Gas Management System (GMS) as
an element of a new generation of atmosphere control systems for nuclear
submarines.

The GMS will interface with the atmosphere control equipments now operational
within nuclear submarines. Operator and maintainer training is needed to
support the GMS. The planned approach is to develop an operator/maintenance
trainer to support GMS training requirements. The device will consist of a
full-size GMS cabinet, a microprocessor, local display panels, a keyboard,
switches, and indicators located in the same configurations as actual
equipment plus an instructor's input/output (I/O) device. The trainer will
provide mechanical and electrical/electronic maintenance training. Most
components of the training device will be the same as, or replicas of, those
used on the actual shipboard equipment, including the microprocessor and the
bulk of the software.

In FY 84, it is planned to award the contract for the prototype system in
March. Design development will begin and continue through to Design Review in
November. Fabrication will begin upon completion of a successful Design
Review.

PAYOFF/UTILIZATION:

The payoffs of this Project are improved readiness, training, and safety of
the submarine force through the development of a Gas Management System. This
system will be part of the atmosphere control equipment for nuclear
submarines.

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III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61153N						DEFENSE RESEARCH SCIENCES
RR04204	ONR	0.879	0.886	MP	3	PERSONNEL UTILIZATION
RR04206	ONR	4.317	6.292	ET	6	LEARNING AND TRAINING
RR04208	ONR	1.933	2.198	MP	2	ORGANIZATIONAL EFFECTIVENESS
RR04209	ONR	2.467	2.815	HF	4	ENGINEERING PSYCHOLOGY
WR04210	NAVAIR	0.320	0.340	HF	4	HUMAN FACTORS ENGINEERING
		9.916	12.531			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 61153N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	9.916	12.531

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(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62757N						HUMAN FACTORS AND SIMULATION TECHNOLOGY
F57-242	NTEC	0.000	0.222	ST	6	TACTICAL INFORMATION CORRELATION
F57-525	NADC	3.265	3.725	HF	4	HUMAN FACTORS TECHNOLOGY
F57-526	NTEC	3.679	3.615	ST	6	SIMULATION TECHNOLOGY
F57-701	ONR	0.365	0.405	HF	4B	SMALL BUSINESS
		7.309	7.967			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62757N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	7.309	7.967

(CONTINUED)

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62763N						PERSONNEL AND TRAINING TECHNOLOGY
F63-521	NPRDC	4.033	4.649	MP	2	MANPOWER AND PERSONNEL TECHNOLOGY
F63-522	NPRDC	1.461	1.807	ET	6F	COMPUTER-AIDED EDUCATION AND CLASSROOM TRAINING
F63-528	NPRDC	0.190	0.000	HF	2B	PERSONNEL PERFORMANCE ASSESSMENT AND ENHANCEMENT
		5.684	6.456			TOTAL IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62763N :			
THE PRESIDENT'S BUDGET, JANUARY 1984		5.684	6.456

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(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63701N						HUMAN FACTORS ENGINEERING
W0542	NADC	0.641	0.676	HF	4A	AIR HUMAN FACTORS ENGINEERING TECHNOLOGY
Z1771	NPRDC	0.551	1.186	HF	4	GENERAL HUMAN FACTORS ENGINEERING
		1.192	1.862			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63701N :		
THE PRESIDENT'S BUDGET, JANUARY 1984	1.192	1.862

(CONTINUED)

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63707N						MANPOWER CONTROL SYSTEMS DEVELOPMENT
Z1770	NPRDC	1.805	5.074	MP	2	MANPOWER AND PERSONNEL DEVELOPMENT
		1.805	5.074			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63707N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.805	5.074

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63720N						EDUCATION AND TRAINING
Z1772	NPRDC	2.239	5.062	ET	6	EDUCATION AND TRAINING DEVELOPMENT
		------	------			
		2.239	5.062			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63720N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	2.239	5.062

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63727N						ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION
T1805	NSRDC	0.000	5.023	ET	5	NAVY AUTOMATED PUBLISHING SYSTEM
T1806	NSRDC	0.000	2.171	ET	5B	LOGISTICS SYSTEMS INFORMATION NETWORK
W1032	NSRDC	1.697	3.339	ET	5D	NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM
		1.697	10.533			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63727N :		
THE PRESIDENT'S BUDGET, JANUARY 1984	1.697	10.533

(CONTINUED)

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63732M						MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS
C0073	HQMC	1.701	1.689	MP	1A	HUMAN RESOURCES MANAGEMENT AND FORECASTING
C0074	HQMC	0.114	0.338	ST	6G	TRAINING DEVICES AND SIMULATORS
C0867	HQMC	0.196	0.908	ET	6F	MARINE CORPS TRAINING RESOURCES DEVELOPMENT AND ANALYSIS
C1732	HQMC	0.098	0.083	ET	6F	USMC PROFESSIONAL MILITARY EDUCATION
		------	------			
		2.109	3.018			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63732M :	FY84	FY85
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THE PRESIDENT'S BUDGET, JANUARY 1984	2.109	3.018

(CONTINUED)

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63733N						TRAINING DEVICES TECHNOLOGY
W1773	NTEC	6.555	7.785	ST	6	TRAINING DEVICES TECHNOLOGY
		------	------			
		6.555	7.785			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63733N :		FY84	FY85
		------	------
THE PRESIDENT'S BUDGET, JANUARY 1984		6.555	7.785

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64703N						TRAINING AND PERSONNEL SYSTEM DEVELOPMENT
X1328	NTEC	2.823	0.000	ST	6C	BATTLE GROUP TACTICAL TRAINER
Z1385	NTEC	0.462	0.000	MP	2D	COMPUTER ADAPTIVE TESTING
Z1822	NAVSEA	0.000	1.179	ST	6G	MANPOWER AND HUMAN FACTORS ENGINEERING
Z1823	NTEC	0.000	5.326	ST	6	TRAINING AND TRAINING DEVICE SYSTEMS DEVELOPMENT
		3.285	6.505			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64703N :		FY84	FY85
	THE PRESIDENT'S BUDGET, JANUARY 1984	3.285	6.505

(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

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             PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

64714N                                        AIR WARFARE TRAINING
                                              DEVICES

  W1112      NAVAIR      11.585  3.125  ST    6      SH-60B TRAINERS
                        ------- ------
                        11.585  3.125              TOTAL IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 64714N :              FY84     FY85
                                                         ------   ------
                 THE PRESIDENT'S BUDGET, JANUARY 1984   11.585    3.125
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(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715N						SURFACE WARFARE TRAINING DEVICES
Z1126	NTEC	0.941	0.000	ST	6	SURFACE TOMAHAWK TRAINER
Z1127	NTEC	0.469	0.400	ST	6	FFG-7 PIERSIDE COMBAT SYSTEM TEAM TRAINER
Z1130	NTEC	0.196	0.000	ST	6	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY
Z1131	NTEC	0.821	0.000	ST	6	DEVICE 14E19/14E25/14E25A MODIFICATIONS
Z1132	NTEC	6.243	4.774	ST	6	LAMPS MK III/SQQ-89 TRAINING SYSTEMS
Z1134	NTEC	0.291	0.000	ST	6	OUTBOARD OPERATOR/TEAM TRAINER
Z1140	NTEC	0.372	1.998	ST	6	TACTICAL ADVANCED COMBAT DIRECTION ELECTRONIC WARFARE (TACDEW) MODIFICATIONS
Z1268	NTEC	1.658	0.000	ST	6	AN/SQR-18A SONAR OPERATOR/TEAM TRAINER
Z1270	NTEC	5.712	5.872	ST	6	UNIVERSAL/SQQ-89 SONAR MAINTENANCE TRAINER
Z1274	NTEC	2.932	4.935	ST	6	AIR INTERCEPT/ANTI-SUBMARINE AIR CONTROLLER TRAINER
Z1427	NTEC	3.044	5.927	ST	6	SURFACE TACTICAL TRAINERS
Z1434	NTEC	0.955	0.357	ST	6	SHIPBOARD "ORGANIC" COMBAT SYSTEM TEAM TRAINER (SOCSTT)
Z1435	NTEC	0.135	0.000	ST	6	SHIPHANDLING TRAINING SYSTEM

(CONTINUATION WITHIN PE 64715N)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
Z1436	NTEC	0.759	0.775	ST	6	SURFACE WARFARE TRAINING ANALYSIS
Z1605	NTEC	2.541	4.635	ST	6C	TERRIER NEW THREAT UPGRADE TEAM TRAINER
Z1834	NTEC	0.000	2.500	ST	6	LANDING CRAFT AIR CUSHION OPERATOR TRAINER
		27.069	32.173			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64715N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	27.069	32.173

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(CONTINUATION)

III-B-1: LISTING OF NAVY PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64716N						SUBMARINE WARFARE TRAINING DEVICES
S1735	NTEC	0.577	0.486	ST	6	GAS MANAGEMENT SYSTEM TRAINER
		------	------			
		0.577	0.486			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64716N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	0.577	0.486

III.C. AIR FORCE PROGRAM ELEMENT AND PROJECT SYNOPSES

Table III-C-1: Listing of Projects - Lists projects for each AIR FORCE program element. Lists contain performing organization, funding, Congressional Category and goal information.

III-C-1

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PROGRAM ELEMENT OVERVIEW

PE: 81102F   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                                    HUMAN FACTORS
                                    SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

FUNDING: FY84 $ 5.5M (FY85 PRESIDENT'S BUDGET)
                                    FY85 $ 5.7M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to conduct research to provide a
foundation for developing new and better training personnel systems and human
factors designs, and for improving performance in command and control
environments.

The Air Force is faced with the problem of providing personnel with the
skills needed to develop, operate, maintain, and manage increasingly complex
weapon systems as the number and quality of entering personnel decline. One
goal of this research is to develop and maintain a high quality work force by
increasing the effectiveness of the selection, training, and utilization of
people. Work is aimed at developing new and/or innovative systems for
training complex tasks and at understanding the learning process. Research in
visual sciences is directed toward providing knowledge essential to the
design of the most effective displays, training systems, and flight
simulators.

Specific objectives include establishing an improved manpower and personnel
system and defining the role of the operator in the design and operation of
increasingly complex operator-machine systems such as advanced aerospace
systems. This includes studying basic human abilities, human-computer
interaction capabilities (such as the essential interactions of operators and
weapon systems) and developing quantitative measures of workload. Research
will also characterize and predict human capabilities relative to military
occupational requirements. Other areas of study are methods to advance the
use of simulation in flying and technical training, visual processing in
simulation training and in system design, and information processing and
decision aiding in command and control contexts.

Basic research will be conducted to provide the theoretical framework for
developing more effective techniques to predict, train, and assess
performance. Such research is relevant to: (a) manpower and force management,
(b) air combat tactics and training, and (c) weapon system logistics and
maintenance. Major research foci are: (a) understanding the fundamental
dimensions of skill acquisition, (b) accurate predictions of individual
differences, and (c) determination of underlying factors in team performance.

Optimal design of weapon systems requires fundamental knowledge about the way
the human brain receives, processes and responds to available information.
The goals of research efforts in this area are: (a) to provide basic
knowledge of those sensory-perceptual, cognitive, and response
characteristics that underlie task performance capabilities, (b) to develop
methods and principles that translate this information into new ways to
interface operators with their equipment, and (c) to develop methods for
assessing the human's contribution to systems.

In FY 1984 the program is scheduled to accomplish many tasks. The

III-C-1

biocybernetics/workload research program is aimed at finding non-invasive
techniques to monitor the brain activity of humans as they perform work
tasks. The program is also investigating the possibility of using dynamic,
rather than static, learning tests as job-specific performance predictors.
The vision programs are focused on developing a comprehensive, integrated,
quantitative model of visual information processing. Efforts are being
directed toward developing a unitary measure to describe human and non-human
parameters of target acquisition. Also being studied are the nature and
limitations of brain mechanisms responsible for perception of form, depth,
and motion. Research is aimed at specifying the voluntary eye movement
patterns which achieve optimal visual processing of complex, dynamic patterns
of information. Other goals are the discovery of the constraints and
facilitation involved in coupling auditory and visual processing of essential
information by the human operator and comparing traditional behavioral
measures of visual processing with gross physiological measures. Efforts
designed to use biological models of visual processing to develop man-made
image processors are being interrelated with electronics and mathematical
research in an initiative in image understanding.

In FY 85 the biocybernetics/workload program will continue classifying the
elemental building blocks of human information processing activities both
spatially and temporally. The relationship of this effort to the broader
field of psychophysiology will be examined. Research will continue to
systematically describe parameters of learning retention and reacquisition of
essential skills for Air Force enlistees. The extramural vision program will
be expanded to include auditory information processes and attention
mechanisms. Studies of human visual processing will continue to extrapolate
results from controlled laboratory environments to the complex, dynamic
environments required for operational effectiveness. Other areas to be
studied include the means to specify the characteristics and constraints on
displayed information to achieve optimal operator performance, and to provide
mathematical models of human vision and to suggest biological models to be
incorporated into image processing and robotic systems.

PAYOFF/UTILIZATION:

The payoff of this Program Element is the enhanced knowledge which can aid
the future development of new training devices and improve the methods of
assessment and prediction of human abilities for better selection and
training, and for enhanced design of manned weapons systems. Especially
relevant is increased understanding of the need for visual systems which
enhance learning, and for increasing the ability of humans to operate complex
systems by providing knowledge of the way in which humans receive, process,
and output information. Ultimately, enhancement techniques (e.g., new
displays, decision aids) must be provided to alleviate the extremely high
information input and processing requirements imposed by high technology
systems on operators.

One example of a payoff is the development of new quantitatively based
metrics that will maximize the photointerpretability of digitized imagery by
specifying machine-generated imagery processing requirements in hard (photo)
and soft (CRT-displayed) formats in keeping with human information extraction
capabilities. Another example is the development of a new physical test
battery that will accurately predict personnel capabilities to do physically
demanding work in terms of physical work requirements. A third example is the
possible development of non-invasive brain activity monitoring techniques
which would make it possible to monitor the performance of pilots and other
equipment operators. This would allow the equipment to be adjusted during
changing task demands to optimize performance of the human-machine system.

FUTURE DIRECTIONS:

No major changes are planned in this Program Element. The major thrust areas
for the next few years will be in the general areas of: (a) visual
information processing, (b) development of new workload metrics based on
researching new biocybernetics techniques, and (c) performance prediction
based on systematic investigation of parameters of learning ability. Several
reviews of contract and in-house work are held each year in the thrust areas.
These are a valuable source of information exchange since representatives of
other military services and agencies are invited to participate.

PROJECT OVERVIEW

		84	85
PROJECT: 2313-A4	HUMAN FACTORS ENGINEERING	$ 1.2M	$ 1.2M
PE: 61102F	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE OFFICE OF SCIENTIFIC RESEARCH		

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) provide basic knowledge of human visual/perceptual, cognitive, and response characteristics, and (b) translate such characteristics and task performance information into new concepts, design principles, and methods to apply to operator-equipment interfaces.

The Project will provide biocybernetics technology consisting of automated, adaptive feedback loops between persons and machine by a noninvasive, unobtrusive, realtime, on-line biological linkage. This linkage will be made of sensory/perceptual, cognitive, and response processes as human psychophysiological outputs, and will permit: (a) more rapid, equitable sharing of operator-equipment systems control, and (b) more effective crew systems design and operation.

Specifically, the research will emphasize: (a) identifying the physiological substrates of the components of information processing behavior, (b) coding the elemental component processes as distinct channels of sensory/perceptual, cognitive, and response processes, (c) developing new neuropsychophysiologically-based metrics for indexing and controlling workload demands, and (d) developing a psychophysiological test battery of generic human capabilities representative of operational task requirements to serve as a template for biocybernetically-controlled person-machine interfaces. The research will use both electrophysiological and neuromagnetic techniques that encompass: (a) sensory/perceptual aspects, (b) cognitive aspects, (c) response aspects, (d) multiple psychophysical measures, and (e) evoked fields.

PAYOFF/UTILIZATION:

The payoffs of this Project will be improved operator-equipment interfaces and increased effectiveness in crew system design and operation. Achievements during the past year are in the areas of: (a) reciprocity of information processing resources, and (b) shifting lateralization of brain electrical patterns.

PROJECT OVERVIEW

		84	85
PROJECT: 2313-A5	VISUAL INFORMATION PROCESSING	$ 2.9M	$ 3.0M
PE: 61102F	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE OFFICE OF SCIENTIFIC RESEARCH		

PROJECT SYNOPSIS:

The objective of this Project is to quantitatively describe human visual processing to apply to the design and organization of information presented on visual displays.

Psychophysical and neurophysiological procedures will be used to isolate and specify stimulus requirements and to discover underlying neural mechanisms. Essential individual factors to be considered include spatial and temporal interactions, perception of patterns, and the effects on visual perception of memory, attention, expectation, auditions, and eye movements. Scientific approaches will be developed for sensory encoding, sensory interpretation, and attention.

In FY 84, work will begin on the following: (a) a study of the commonality of multi-modal attributes using cross-modality matching techniques, (b) effects of spatial frequency masking patterns on the detection and recognition of objects in natural scenes, and (c) comparison of attention and information processing in the fovea and para-fovea.

PAYOFF/UTILIZATION:

The payoff of this Project will be improved weapon systems design through the development of quantitative models of human vision.

Results thus far suggest that specific visual motor training procedures can significantly measure the speed and accuracy of the operator's ability to detect, identify, and respond to visual information. Pilots trained by such procedures will have the advantage of recognizing the enemy much earlier than pilots who do not have this training. Specific findings include: (a) the discovery that the addition of texture to visual targets does not improve perception of motion-in-depth, i.e., the pilot's ability to compute direction in time to impact with an oncoming object, and (b) evidence that pre-programmed habitual eye movement patterns are used to scan visual displays.

The past year's accomplishments include: (a) a model that integrates signal detection and attention, (b) a model that predicts size discrimination, and (c) the finding that luminance gradients provide cues to depth.

PROJECT OVERVIEW

		84	85
PROJECT: 2313-T1	MANPOWER MANAGEMENT	$ 0.6M	$ 0.6M
PE: 61102F	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to determine the nature and limits of human
learning and to apply that knowledge to selection and training procedures for
Air Force weapon systems operators.

High technology weapon systems impose increasing burdens on the educational
resources of the Air Force in the form of increased standards for skills.
Basic research is needed to define the meaning of baseline performance levels,
and to determine the internal and external variables which influence both
the differences in rate and the limits of skill acquisition and skill
retention across individuals. While the state-of-the-art in ability testing
stagnated in the 1950's, microcomputer technology has now made possible a
quantum jump in the area by providing: (a) direct measurement of learning
efficiency under controlled conditions, (b) measurement of previously
unevaluated abilities, (c) measurement of response latencies (a key to
evaluating the speed of mental functioning), and (d) adaptive testing. The
work in this Project is directed toward discerning information processing
limits and using this knowledge to discover how the training environment can
best be manipulated to effect the necessary transfer of training.

The approaches taken to reach objectives are: (a) human experiments concerned
with increasing our knowledge of the fundamentals of information processing,
and (b) controlled laboratory experiments to determine learning abilities and
predict performance. Work is also being done to investigate learning rates,
the role of short- and long-term memory, skill decay and reacquisition,
response latencies, learning slopes, multitask performance, spatial functions
and the relative efficiency of various learning modalities. Scientific
approaches are as follows: (a) evaluate parameters of learning curves from
complex cognitive tasks as predictors of skill and knowledge acquisition,
decay, and reacquisition, (b) develop and evaluate measures in new ability
domains, (c) evaluate standard cognitive tasks as replacements for or
supplements to conventional tests, and (d) evaluate new types of information
which can be obtained from microcomputer administration of conventional
tests. This Project will use an atypical approach to the study of cognitive
tasks that will include: (a) large, heterogeneous samples, (b) emphasis on
individual performance, (c) multiple task analyses, (d) complex multivariate
analyses, (e) relationships with conventional tests, (f) factor structures,
and (g) relationships with learning abilities.

PAYOFF/UTILIZATION:

The payoffs of this Project will be procedures to enhance the acquisition of
complex skills critical to the Air Force mission. This will be accomplished
by understanding the basic nature and limits of human information processing
capabilities.

The past year's accomplishments include: (a) analyses of standard cognitive tasks, (b) the Bivariate Outlier Detection and Replacement System (BODARS), and (c) studies of individual differences in elementary cognitive processes.

PROJECT OVERVIEW

		84	85
PROJECT: 2313-T3	FLYING TRAINING RESEARCH	$ 0.3M	$ 0.3M
PE: 61102F	DEFENSE RESEARCH SCIENCES		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to quantitatively study the capabilities and limits of visual information processing in complex, dynamic environments to best design and organize the information presented on visual displays.

This Project will focus on directional sensitivity, perceptual learning; and the effects of optical flow fields. Scientific approaches will include: (a) object motion versus self motion thresholds for peripherally presented stimuli, (b) systematic manipulation of optical flow parameters in controlled dynamic environments, and (c) isolating color mechanisms with an adaptation paradigm, and determining the threshold for blue wavelengths at varying pupil entry points.

PAYOFF/UTILIZATION:

The payoff of this Project will be improved visual displays resulting from research on visual information processing in complex, dynamic environments.

Work completed during FY 82 and FY 83 includes: (a) multiple physiological measures in flight related tasks of varying workload, (b) multiple biochemical indices in flight related tasks of varying levels of stress, (c) identification of decision making strategies given multiple inputs of varying reliability, and (d) determination of the cognitive organization of flight related knowledge.

PROJECT OVERVIEW

		84	85
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PROJECT: 2313-V1   FUNDAMENTALS FOR $ 0.2M $ 0.2M
                          MAN-MACHINE INTEGRATION

PE: 61102F   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE AEROSPACE MEDICAL RESEARCH LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to provide basic knowledge of human
visual/perceptual, cognitive, and response characteristics, and to develop
methods and principles which permit translation of such characteristics and
task performance information into new concepts, design principles, and
methods for human-equipment interfaces.

Rapid advances in increasingly complex Air Force weapon systems development
have greatly enlarged requirements for extending knowledge of vital human
operational capabilities to ensure effective uses of these systems. The
measurement of sensory/perceptual, cognitive, and response characteristics of
man which underlie flight operations, pattern recognition, reconnaissance,
photo interpretation, target acquisition, and display enhancement are being
pursued. This will permit the quantitative analysis, comparison, and
evaluation of total man-sensor-processor-display systems. Studies will be
conducted to identify specific brain locations which subserve specific
cognitive activities using neuromagnetic techniques, to expand the
understanding and meaning of electrophysiologically-based components and
parameters of evoked responses.

PAYOFF/UTILIZATION:

The payoff of this Project will be improved use of complex Air Force weapon
systems through knowledge of human cognitive/perceptual characteristics.

PROJECT OVERVIEW

	84	85

PROJECT: 2313-V2   BASIC VISION RESEARCH $ 0.4M $ 0.4M

PE: 61102F   DEFENSE RESEARCH SCIENCES

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE AEROSPACE MEDICAL RESEARCH LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is discover principles and mechanisms
underlying human visual processing and to apply those principles to the
design of visual displays and other system components.

Studies will investigate the filtering characteristics of the overall visual
system using both psychophysical and evoked potential techniques, and will
concentrate on implications for target acquisition processing and display
design. Scientific approaches include: (a) linear systems analysis, (b) a
multichannel model, and (c) model validation.

PAYOFF/UTILIZATION:

The payoff of this Project will be enhanced effectiveness in the training and
operational environment as a result of the application of findings of visual
information processing research.

Results thus far suggest that specific visual motor training procedures can
measure the speed and accuracy of the operator's ability to detect, identify,
and respond to visual information. Pilots trained by such procedures will
have the advantage of recognizing the enemy much earlier than pilots who do
not have this training. Specific findings include: (a) the discovery that the
addition of texture to visual targets does not improve perception of
motion-in-depth, i.e., the pilot's ability to compute direction in time to
impact with an oncoming object, and (b) evidence that pre-programmed habitual
eye movement patterns are used to scan visual displays. Further experiments
are planned to find out whether visual processing benefits from such
pre-programmed patterns. Progress has also been made in determining a number
of factors influencing human image processing.

PROGRAM ELEMENT OVERVIEW

PE: 62202F   AEROSPACE BIOTECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

FUNDING: FY84 $14.6M (FY85 PRESIDENT'S BUDGET)
                              FY85 $15.9M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to: (a) improve the performance of
the human component of weapon systems/operations by refining crew selection
and maintenance, crew protection, and man-machine integration, (b) improve
safety and environmental protection from radiation, chemical, and mechanical
forces noise, (c) establish threat characterization and countermeasures
effectiveness against Soviet weapon systems, and (d) develop chemical defense
measures for air base operations, casualty care evacuation, and personal
protective equipment.

Aerospace Biotechnology is the core Air Force technology base program to
optimize the role of the human operator in the design, development, and
operation of increasingly complex and technologically sophisticated weapon
systems. Key factors driving the increasing investment in this program
include: reliance on more technology-rich hardware systems to counter the
numerical superiority of threat systems, the requirement to reduce life cycle
costs of weapon systems, the national environmental concern with lifetime
effects of exposure to radiation and chemicals, and the need to retain
operationally experienced aircrew. This Program Element funds the operational
support and management for the research and development activities performed
by the Aerospace Medical Division (AMD), Brooks Air Force Base, Texas. This
includes the research and development activities of the Air Force Aerospace
Medical Research Laboratory (AFAMRL), Wright-Patterson Air Force Base, Ohio,
and the U.S. Air Force School of Aerospace Medicine, Brooks Air Force Base,
Texas.

The Biotechnology Program is one of the Program Elements formally coordinated
under the Armed Services Biomedical Research and Evaluation and Management
(ASBREM) Committee. This committee is modeled after the Joint Logistics
Commanders' forum, is chaired at the general officer level, and serves as the
coordinating and program review agency for DoD Medical and Life Sciences
research and technology. Formal mechanisms with other federal agencies
include the National Aeronautics and Space Administration (NASA)-Air Force
Systems Command Interdependency Working Group, and the joint Army-Navy-NASA
(JANNAF) Propulsion Committee. The program is coordinated on an international
basis through the Air Standardization Coordinating Committee, and several
North Atlantic Treaty Organization groups including the Military Agency for
Standardization, the Defense Research Group, and the Advisory Group for
Aerospace Research and Development. In addition, bilateral agreements and
Data Exchange Agreements exist with appropriate friendly nations. Within Air
Force Systems Command, the program is formally presented to Product Division
Commanders and their Systems Program Directors on a recurring basis,
integrated planning is achieved with other laboratories on new system
concepts, and joint technology programs are developed and executed. Existing
joint technology programs include crew station design, ejection seat design,
threat simulation, environmental quality criteria, audio and visual
countermeasures, and chemical defense. Where coordination is required on a
daily basis, operating locations have been established with other
organizations. The in-house portion of this Program Element is centered on

unique and complex experimental facilities which are generally not available in the aerospace industry or academic institutions. The contract portion complements the in-house efforts for this program.

In FY 84, efforts associated with the Manpower, Personnel and Training (MPT) area (i.e., Projects 06MD, 6893 and 7184) will begin a major thrust in the development of C3 countermeasure technology and control systems. Also in FY 84, efforts will focus on C3 system refinement for the North American Air Defense (NORAD) and Space Command, on display systems for C-141 aircraft, and on human engineering design work for the B-1B cockpit procedures simulator. In FY 85, work will continue on C3 system refinement and countermeasure technologies, and on display and simulation technology for tactical aircraft. Also, the human engineering design reconfiguration of the NORAD Command Post will be completed in FY 85.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) the design of more effective weapon systems which capitalize on advanced human engineering concepts and techniques, (b) the development of realistic trade-off options in system design and mission planning to increase overall effectiveness and achieve economy of operations, (c) the development of technologies and operational procedures which will ensure maximum protection and survivability for aircrews, (d) refinement of C3 system designs for the NORAD Command Post, (e) the development of advanced display and simulation technology for tactical aircraft systems, and (f) completion of the final study of the human engineering requirements for the Shuttle Operations and Planning Complex.

The Biotechnology Program recognizes that man is a key element in every military operation, and therefore explicitly addresses the utilization of man in accomplishing the various Air Force missions. Changing operational requirements, new technologies, and increasingly sophisticated and complex weaponry place continually greater demands on system operators and maintainers. This Program Element focuses on research and development which will result in the optimal utilization of Air Force personnel within a complex technological environment.

FUTURE DIRECTIONS:

The Manned Threat Quantification (MTQ) portion of Project 6893 is undergoing an evolutionary change. Many of the original objectives of evaluating and quantifying the effectiveness of detection and firing/tracking tasks in manned threat systems have been accomplished and the efforts are now being redirected toward the development of C3 countermeasure technologies via operator functions, and integrated systems for C3, strategic, and tactical applications. With this new direction, MTQ research will have a broader application in the areas of aircraft survivability assessment and in the design of effective manned weapon systems.

The major directions planned for Project 7184 are to investigate the human factors issues of military man in space and to develop and apply new methodologies and technologies which will optimize the human component in tactical and strategic aerospace and extra-vehicular activity (EVA) operations.

Long range goals for the MPT portion of this Program Element include the development of dynamic models to predict operator stress limits and performance effectiveness, the development of design criteria and mission planning guides to reduce operator overload and optimize man-machine integration, and the design and development of integrated display/control systems for airborne and aerospace missions.

PROJECT OVERVIEW

		84	85

PROJECT: O6MD AEROSPACE MEDICAL $ 8.8M $ 9.5M
DIVISION LABORATORY
OPERATIONS

PE: 62202F AEROSPACE BIOTECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AEROSPACE MEDICAL DIVISION

PROJECT SYNOPSIS:

The objective of this Project is to provide the resources to conduct the
in-house research and development activities of the Aerospace Medical
Division (AMD) at Brooks Air Force Base, Texas and its research and
development laboratories.

It accounts for about 49 percent of the exploratory development funds for
Program Element 62202F, which is predominantly conducted by specialized
scientific teams using complex, unique research facilities and devices. The
Project provides for the pay and related costs of civilian physicians,
scientists, engineers, and support personnel as well as for travel,
transportation, rents, communications, utilities, laboratory supplies and
unique equipment and other related costs needed to conduct biotechnology
research and development. The program managed by AMD is one of research and
exploratory development in biotechnology. The research and development
efforts are designed to specifically define man's limits with regard to
adaptability, survivability, and performance capabilities within his
operational environment.

PAYOFF/UTILIZATION:

The payoff of this Project involves the provision of resources to enable the
in-house research and development activities of AMD and its laboratories to
be conducted.

This Project allows and facilitates the research efforts of the Aerospace
Biotechnology Program. These coordinated efforts form the basis for: (a)
better designed and more effective weapon systems that capitalize on and
enhance man's abilities, (b) realistic trade-off options in system design and
mission planning to increase overall effectiveness and achieve economy of
operations, (c) maximum protection and survivability of aircrews, and (d)
realistic criteria for selecting and caring for military personnel to
maintain an Air Force fully responsive to operational requirements and
national goals.

PROJECT OVERVIEW

		84	85
PROJECT: 6893	MANNED WEAPON SYSTEMS EFFECTIVENESS	$ 1.6M	$ 1.8M
PE: 62202F	AEROSPACE BIOTECHNOLOGY		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AEROSPACE MEDICAL DIVISION		

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) quantify the contribution of threat system operators to total threat effectiveness, (b) develop effective countermeasures against threat crew systems, (c) develop effective camouflage, concealment, and deception mechanisms, and (d) develop man-in-the-loop and computer simulation procedures to assess competing system designs.

Work under this project will evaluate the human factor aspects of potential enemy systems, and develop countermeasures to these threats.

In FY 84, the Project begins a major new thrust in the development of C3 countermeasure technology via operator deception and disruption, and integrated control/display systems for C3 and strategic and tactical aircraft applications. Plans for FY 85 include the continuation of threat C3 operations defeat mechanism development, and the development of technology for a human operator, perceptually based, terrain avoidance/terrain following (TA/TF) system.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the specification of human-centered design criteria for runway and aircraft deception, (b) confusion paint schemes and decoy systems for airbase survivability, (c) attack algorithms for computer-aided weapon delivery systems, (d) effective threat crew system countermeasures, and (e) simulation procedures for assessing competing system designs.

The efforts under this Project will lead to improved survivability against enemy threat systems, validated criteria for simulator design, and increased knowledge of manned threat system capabilities and vulnerabilities.

PROJECT OVERVIEW

		84	85
PROJECT: 7184	MAN-MACHINE INTEGRATION TECHNOLOGY	$ 4.2M	$ 4.6M

PE: 62202F   AF˙ SPACE BIOTECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AEROSPACE MEDICAL DIVISION

PROJECT SYNOPSIS:

The objective of this Project is to develop methodologies and technologies to maximize the efficiency and effectiveness of the human operator interface with Air Force systems.

The combination of low-level high-speed flight profiles with high threat densities and night/adverse weather environments increases the criticality of the human component to mission success.

In FY 84, efforts under this Project will: (a) develop an austere night vision goggle head-up display demonstrator for C-141 aircraft, (b) continue C3 system refinement efforts for the North American Air Defense (NORAD) and Space Command, (c) develop a helmet-mounted display for Air Force spacecrew extra-vehicular activity (EVA) operations, (d) continue validation of a test for assessing aircrew workload, and (e) begin human engineering design work on the B-1B cockpit procedures simulator. Plans for FY 85 include efforts to: (a) complete human engineering design reconfiguration of the NORAD Command Post, (b) continue development of the B-1B simulation system, (c) continue development of night vision goggle head-up display technology, and (d) pursue the development of virtual image technology and tactical aircraft displays.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) a strength screening program for pilots, (b) the development of data for inclusion in aircraft design guides and standards, (b) the determination of human engineering requirements for the Shuttle Operations and Planning Complex, (c) specification of design alternatives for the NORAD Command Post Replacement Program, (d) advanced display technology for C-141 aircraft and EVA operations, and (e) a simulation device for B-1B cockpit procedures.

Human engineering technology is focused principally on optimizing total system performance through improving system operator performance. Although savings through increased operating efficiency, improved training technology, and lower accident rates are substantial, benefits become most apparent when consideration is given to the total, coordinated research and development program and the subsequent utilization of the products and information produced.

PROGRAM ELEMENT OVERVIEW

PE: 62205F	TRAINING AND SIMULATION TECHNOLOGY
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING HUMAN FACTORS SIMULATION & TRAINING DEVICES
DoD ORGANIZATION:	AF
FUNDING:	FY84 $22.5M (FY85 PRESIDENT'S BUDGET) FY85 $23.3M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to improve operational readiness
through more effective training and increased weapon system supportability.

A major research area concerning flight simulation uses the Advanced
Simulator for Pilot Training (ASPT), a large field-of-view visual flight
simulator. This simulator and related devices are used to conduct research to
develop innovative methods for flight simulator training in general, to
define simulator training effectiveness requirements, and to develop
innovative techniques for training tactics used in air-to-ground and
air-to-air combat. Another major research area investigates techniques for
enhancing maintenance and technical training by developing and evaluating
computer-based instructional technologies and maintenance training simulators
for use in lower cost, more effective technical training. A third major
research area concerns the logistics support of weapon systems and
improvements that can be made by determining the interactions between the
human elements of the logistics and maintenance system, and the associated
characteristics of weapon systems.

The majority of the work under this Program Element is directly in support of
requirements identified by major commands, Air Staff agencies, and separate
operating agencies. Formal agreements exist which specify coordinated support
for work conducted at the Air Force Human Resources Laboratory (AFHRL),
including cooperative agreements with the Navy and Army on work related to
such efforts as: visual display light valve projector and advanced computer
image generation technology development, flying training research and
development, the development of flight training schedules using Advanced
Instructional System (AIS) software, simulator research and development,
development of a computerized instructional system, and research on command
and control systems.

In FY 84 and FY 85, work under this Program Element will focus on such tasks
as: software conversion for the AIS, data collection for the Air Force's
Integrated Training System, development of performance measures for and
determination of the training effectiveness of Strategic Air Command (SAC)
and Tactical Air Command (TAC) pilot training, the further development and
evaluation of the ASPT, the development of various models to improve combat
maintenance capability in the area of aircraft logistics support, descriptive
and quantitative modeling of tactical C2 systems, and the design and
development of a videodisc-based simulator for flight training.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) the development of improved
flight simulator hardware, which will increase training efficacy and reduce
training cost, (b) the design and development of better simulators for

maintenance training, which will result in reduced training costs by obviating the need for expensive operational equipment currently used for hands-on training of maintenance technicians, (c) the design and development of computer-based and videodisc-based instructional technologies for technical and flight training, and (d) the development of a unified data base for emerging weapons systems to replace the multiple, redundant and confusing data bases currently being used and to provide designers with highly consistent, accurate information.

The work efforts associated with this Program Element will result in the development of new training technologies and logistics support methodologies which are expected to increase the productivity of Air Force personnel, improve the cost-effectiveness of technical and flight training, and result in enhanced operational readiness.

FUTURE DIRECTIONS:

Future work under this Program Element will continue to focus on the design, development and evaluation of new technologies for maintenance and flight training. The development and utilization of advanced simulation devices, employing computer-based and videodisc-based technology, is considered important insofar as it contributes significantly both to training efficacy and to a cost-effective Air Force training program. Software and hardware developments in the areas of training, training management and aircraft logistics support will be pursued further, toward the ends of providing the Air Force and the other services which are participating in this coordinated research and development program with enhanced training capabilities, improved C2 and C3 systems, and resultant benefits to overall personnel utilization and productivity.

PROJECT OVERVIEW

		84	85
PROJECT: 06HT-1	LABORATORY SUPPORT	$ 1.6M	$ 1.7M
PE: 62205F	TRAINING AND SIMULATION TECHNOLOGY		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to provide for part of the operation of the
Air Force Human Resources Laboratory (AFHRL) at Brooks Air Force Base, Texas,
including pay and related costs of civilian scientists and support personnel,
travel, transportation, rent, communications, maintenance, procurement of
supplies and equipment, and contractor support services.

The laboratory performs R&D in manpower and force management, weapon systems
logistics, maintenance and technical training, and air combat tactics and
training in support of immediate or potential needs of Air Force operational
systems. This Project supports and complements all Projects within Program
Element 62205F and supports the Congressional Category of Education and
Training.

PAYOFF/UTILIZATION:

The payoff of this Project includes enabling the many and varied research
tasks of AFHRL at Brooks Air Force Base, Texas to be accomplished by handling
the support functions of the lab such as travel, transportation,
communications, maintenance, procurement of supplies and equipment, etc.

PROJECT OVERVIEW

		84	85
PROJECT: 06HT-2	LABORATORY SUPPORT	$ 4.9M	$ 4.9M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to provide for part of the operation of the Air Force Human Resources Laboratory (AFHRL) at Brooks Air Force Base, Texas, including pay and related costs of civilian scientists and support personnel, travel, transportation, rent, communication, maintenance, procurement of supplies and equipment, and contractor support services.

The laboratory performs R&D in manpower and force management, weapon systems logistics, maintenance and technical training, and air combat tactics and training in support of immediate or potential needs of Air Force operational systems. This Project supports and complements all Projects within Program Element 62205F and supports the Congressional Category of Simulation and Training Devices.

PAYOFF/UTILIZATION:

The payoff of this Project includes enabling the many and varied research tasks of AFHRL at Brooks Air Force Base, Texas to be accomplished by handling the support functions of the lab such as travel, transportation, communications, maintenance, procurement of supplies and equipment, etc.

PROJECT OVERVIEW

		84	85
PROJECT: 1121	TECHNICAL TRAINING DEVELOPMENT	$ 2.3M	$ 1.8M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to continuously assess the types of training, methods of training delivery, and impact of training provided by the Air Force to ensure that Air Force training is of high quality, is job-relevant, cost-effective, and emphasizes: (a) computer-based training, (b) computer-managed training, (c) instructional and learning strategies, (d) training design and evaluation techniques, and (e) progressive training support and delivery (which may result from studies of artifical intelligence systems).

In FY 84, it is planned to: (a) convert the Advanced Instructional System software to standardized Instructional Support Software (ISS) in the Ada programming language (thus providing a wide range of applicability for the ISS software across the Air Force and DoD in general, and giving software support to several Air Force Human Resources Laboratory (AFHRL) projects), (b) begin a long-range program to develop "intelligent" computer systems (i.e., artificial intelligence) for maintenance and training that will produce a prototype maintenance diagnostics, training, and organizational support system for a subcomponent of an existing weapon system, (c) begin a front-end analysis to establish an experimental training capability to integrate R&D findings in manpower, personnel, and training, and (d) begin task analyses, the definition of performance standards and requirements, and a performance assessment to feed into the Integrated Training System (an advanced system for managing on-the-job training). In FY 85, it is planned to: (a) continue the three long-range efforts started in FY 84, (b) develop a demonstration test bed for the artificial intelligence-based training and maintenance-aiding system, and (c) begin defining the task, environmental, and personnel factors of Air Force maintenance organizations (for use in validating promising technologies for initial skills and field/job-site training).

PAYOFF/UTILIZATION:

The payoffs of this Project include Air Force technical training that is rendered high-quality, job-relevant, and cost-effective through: (a) reduction of average training time using techniques which permit instruction to be individually tailored to a range of student aptitudes and abilities, (b) reduction of the demand for people involvement by automating the administration and management of routine instructional tasks, and (c) provision of realistic job-related experience using low-cost computer-based simulators instead of high-cost operational hardware.

Technical training is highly labor intensive with greatest costs in student

and instructor salaries. There is almost a direct relationship between reductions in training time and reductions in training costs. The current Air Force technical training system is instructionally effective but nonadaptive, labor intensive, and costly. There is a need to improve the cost-effectiveness of Air Force technical training from a total system standpoint.

Recent payoffs include: (a) a successful demonstration of the computer-assisted, daily flight scheduling, Forward Looking Resource Scheduling System, by the Tactical Air Command using terminals connected to the AFHRL computer at Lowry Air Force Base, (b) transfer of the AFHRL advanced computer-based instructional technology to the National Security Agency and the Air Force Manpower Personnel Center, (c) evaluation of instructor roles and behaviors in Air Force nonconventional instruction, (d) development and evaluation of a modular self-tutorial package which shows promise of enhancing the motivational skills of students in nonconventional instructional settings, and (e) completion of functional and engineering specifications for a trainer for the ultrasonic nondestructive inspection technique.

PROJECT OVERVIEW

		84	85
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PROJECT: 1123	FLYING TRAINING DEVELOPMENT	$ 2.8M	$ 2.8M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to apply new methods, techniques, and devices to the training and performance assessment of aircrews, emphasizing increased proficiency during transition and continuation flying training.

In FY 84, it is planned to: (a) continue efforts to develop performance measures of electronic combat capabilities for both the Strategic Air Command (SAC) and the Tactical Air Command (TAC), (b) determine the operational training effectiveness of the SAC B-52/KC-135 Weapon System Trainer, (c) assist the Military Airlift Command (MAC) in developing and evaluating continuation training programs for aerial refueling and the C-130 Weapon System Trainer, (d) continue test and evaluation of part-task trainers along with an all-MAJCOM (major command) requirements survey for such trainers, (e) develop a method for integrating measurements of pilot performance for use in the Simulator for Air-to-Air Combat at Luke Air Force Base, and (f) continue transfer of training studies from the Advanced Simulator for Pilot Training (ASPT) to Red Flag aircraft sorties, using simulated hostile threat environments. In FY 85, it is planned to: (a) increase research efforts on simulator training effectiveness, (b) test advanced radar and other sensor simulation system displays for use in aircrew training in order to define the hardware training effectiveness requirements, (c) pursue the enhancement of pilots' capabilities during hostile engagement by developing a program for specialized training in tactical decision making, and (d) increase the efforts on combat tactics system development and visual scene studies to determine the effects of high resolution areas of interest and target insetting on aircrew performance.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) reduced costs for all types of flying training, (b) improved ability to effectively train aircrew personnel, (c) new instructional methods, techniques, and devices for training and assessing pilot and navigator performance at both undergraduate and combat crew levels, and (d) increased student proficiency.

Recently, prototype development of microcomputer-based part-task trainers was accomplished for MAC's fuel savings advisory system and for loadmaster training. These trainers promise lower cost training by effectively teaching a subset of individual aircrew skills without the need for actual aircraft sorties. This will allow for the more efficient use of aircraft for teaching skills requiring actual flight, such as the overall integration of complex patterns of individual piloting skills. Standard measures of performance, followed by the development of appropriate training strategies to achieve such standards, must also be established in order to further increase the effectiveness of aircrew training.

Other recent accomplishments include: (a) the design of performance measurement surveys for electronic countermeasure skills in SAC and TAC, (b) the development of prototype performance measurement algorithms for tactical air-to-air combat tasks for use on TAC's Simulator for Air-to-Air Combat and Air Combat Maneuvering Range, and (c) the continuation of transfer of training studies for flight simulator combat mission training in the ASPT to aircraft missions at Red Flag.

PROJECT OVERVIEW

	84	85
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PROJECT: 1192   ADVANCED SIMULATION FOR $ 5.2M $ 5.4M
PILOT TRAINING

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to provide for the operation, maintenance
and modification of simulation equipment and software, which is the
foundation for training effectiveness and simulator engineering development
research.

The capabilities of concern include the Advanced Simulator for Pilot Training
(ASPT), the Combat Mission Trainer, the Advanced Visual Technology System,
and related research equipment. These simulation systems support all research
conducted under Project 1123, Flying Training Development, and Project 6114,
Flight Simulator Technology, and provide the primary simulation capabilities
for implementing, demonstrating, and testing training technology and
simulation hardware advances. These capabilities are also used for
demonstrating and testing engineering and training simulation technology
advances developed under related Aeronautical Systems Division and triservice
program elements. In FY 84, the operation and maintenance of the ASPT and its
simulation subsystems will continue. The capability of transferring computer
images from one subsystem to another will be demonstrated using the new
common data base format. The simulation support for related research projects
will continue, including the tactical air combat transfer of training studies
and visual flight simulation studies. Research studies will evaluate the
potential of using a helmet-mounted visual display to adequately portray a
high threat combat environment. Investigation of the field-of-view, intensity,
resolution, and color imagery for helmet-mounted visual displays will be
conducted to identify possible alternatives for costly wrap-around mosaic
CRTs or dome-based visual systems. Simulation systems support will be
extended into simulation for radar imagery, low light level TV, and forward
looking infrared (FLIR) imagery. Demonstrations of alternative display
technologies will be conducted in order to evaluate their application for
low-cost visual displays. In FY 85, operation and maintenance support will
continue on all simulator systems, including the new Advanced Visual
Technology System (PE 63227F, Project 2363). The capability for capturing and
enhancing Defense Mapping Agency data will be developed in order to increase
low-cost, realistic simulation scene generation sources. Simulation support
for related research projects will continue, including training effectiveness
and transfer of training studies, visual and sensor systems requirements
studies, and strategic mission simulation studies.

PAYOFF/UTILIZATION:

The payoffs of this Project involve the advancement of simulation concepts
and simulation technology, particularly in regard to the ASPT, the Combat
Mission Trainer, and the Advanced Visual Technology System.

These and related simulation devices are central to the conduct of research

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and development work supported by other Projects, and thus play an important
role in advancing the state of training systems in general and contributing
to knowledge on transfer of training and the generalizability of skill
acquisition. These are significant training issues across the services, as
cost-effectiveness and training efficacy become increasingly important in a
technologically sophisticated military environment.

PROJECT OVERVIEW

		84	85
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PROJECT: 1710	LOGISTICS AND MAINTENANCE TECHNOLOGY	$ 4.1M	$ 4.3M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to aid in the process of providing weapon systems that are logistically supportable, sustainable, and cost-effective.

Users want and need products that are durable, easily maintained/repaired in the field, cost-effective, and require little or no support equipment. Project 1710 efforts address solutions to these problems. At present, there is no realistic way to measure the extent of combat readiness of a peacetime operational unit to successfully perform aircraft maintenance and logistics support in a combat environment. Previous work under this Project involved the development of a Unified Data Base (UDB) of weapon system logistics information to support the weapon system design process. The UDB enables both contractors and Air Force logisticians to avail themselves of lessons-learned data, failure factor characteristics of components, and reliability, maintainability, sustainability, cost-effectiveness, etc., data early in the weapon system acquisition cycle. Through use of the UDB logistics considerations will be able to influence weapon system design early in the acquisition phase and the acquisition process will proceed more efficiently.

Because of the importance of the UDB in this area, exploratory development will continue in FY 84.

Also in FY 84, efforts will continue to identify the factors that impact combat capability, the differences between peacetime and wartime requirements, and demonstrated procedures, policies, and organizational structures to improve combat capabilities. Work will also continue on the effort to enhance combat maintenance capability in the area of aircraft logistics support. Efforts will begin to explore the feasibility of using a biomechanical model, a computer-aided design model of a maintenance technician, during the acquisition and design phases to improve maintenance supportability. Efforts to improve maintenance diagnostics and built-in test systems to assist maintenance personnel in the more expeditious repair of weapon systems will continue. In FY 85, efforts to improve maintenance for combat readiness, and efforts to refine technologies for the incorporation of maintenance and logistics factors in computer-aided design, will continue. Technologies for an integrated maintenance information system will also be developed.

PAYOFF/UTILIZATION:

The payoffs of this Project include the development of new technology for use in solving training and personnel problems associated with advanced weapon systems.

This will include: (a) improving the technology for considering human resource implications early in the design and acquisition phases for weapon

systems, (b) improving the productivity of Air Force maintenance efforts by
integrating human factors considerations with the application of new
technologies and by developing more efficient combinations of training,
technical data, and operational procedures, (c) identifying and refining the
techniques needed to enhance crew coordination/team training, with attention
directed toward command, control and communications issues, and (d)
establishing a UDB for integrated maintenance information. The UDB will
result in significant improvements to sortie production capability through
better maintenance and management. Maintenance personnel using portable
remote control terminals with computer-aided displays will be able to quickly
diagnose maintenance failures using artificial intelligence technologies
which combine automated technical orders and automated diagnostic systems.

PROJECT OVERVIEW

			84	85
PROJECT: 3017	COMMAND AND CONTROL TRAINING		$ 0.0M	$ 0.8M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to improve training methods for tactical Air Force battle staff personnel by developing new technology to train and evaluate personnel performance in command and control (C2) systems.

Until FY 85, the efforts in this Project are a part of and are funded under Project 1121, Technical Training Development. Since this work is being conducted at a separate Air Force Human Resources Laboratory (AFHRL) division and since C2 battle staff training is significantly different from maintenance and general technical training, a new Project was needed. This Project meets the need for improvements in C2 training for tactical Air Force Battle staff personnel.

In FY 84, it is planned to develop a description of tactical C2 systems in the Rapid Deployment Force, and a peacetime and wartime job requirements comparison. In FY 85, it is planned to explore methods for analyzing peacetime and wartime job performance and training requirements by developing: (a) training requirements evaluation methodologies, (b) peacetime and wartime training and evaluation recommendations, and (c) training program recommendations.

PAYOFF/UTILIZATION:

The payoff of this Project is the increased combat readiness of personnel assigned to tactical C2 functions.

Recent accomplishments (funded under Project 1121, Technical Training Development) include a study to evaluate the training currently being provided to tactical C2 personnel in comparison with their actual wartime functions. The results of this study are being documented in user guides which will allow nontechnical training staffs to plan, develop, and implement training and evaluation programs. These products will include guidelines for C2 training programs, C2 hardware design, human factors specifications for the development of tactical C2 systems, and a quantitative for automating C2 systems.

PROJECT OVERVIEW

		84	85
PROJECT: 6114	FLIGHT SIMULATOR TECHNOLOGY	$ 1.7M	$ 1.8M

PE: 62205F   TRAINING AND SIMULATION TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to develop efficient and effective
simulation hardware technology for future training systems in order to
provide sufficient mission realism for aircrew training and weapon system
exercise and assessment.

In FY 84, it is planned to: (a) complete an initial breadboard, prototype,
fiber-optic, helmet-mounted display and develop the hardware requirements for
a refined version based on training effectiveness evaluations, (b) extend
videodisc applications to the critical low-level, high-speed tactical mission
area, (c) develop variable resolution displays through eye-tracking and
non-linear image generation techniques in order to reduce image display costs,
and (d) develop an R&D variable image processing system to identify minimum
display resolution requirements for acceptable radar and sensor training
effectiveness.

In FY 85, it is planned to: (a) develop a videodisc-based trainer with a
moveable target insertion capability, (b) extend variable resolution visual
display technology to include small dome displays, (c) pursue an improved
visual display system through the development of a high brightness, full
scale Fresnel lens optical system, and (d) develop increased sensor realism
through advanced computer image generation, low light television and infrared
displays.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) improved quality and
cost-effectiveness of training through determination of what types of
simulator technology are most effective for specific training requirements,
(b) simulation techniques which capitalize on human characteristics to
provide cost-effective training devices, (c) engineering methods and hardware
to provide all cues required for effective training, and (d) efficient
methods for implementing simulation by improving computational hardware,
testing dynamic fidelity, and managing the use of advances in fidelity for
training.

Recently, progress was made on the exploratory development of component
technologies for a breadboard, fiber-optic, helmet-mounted display. This
development will provide the proof of concept for such display technology and
will open the way for more affordable, effective display systems.
Additionally, a videodisc-based image generation capability was developed for
air refueling and air-to-ground combat part-task training. This videodisc
capability permits increased mission realism at a lower cost.

PROGRAM ELEMENT OVERVIEW

PE: 62703F   PERSONNEL UTILIZATION TECHNOLOGY

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: AF

FUNDING: FY84 $ 7.0M (FY85 PRESIDENT'S BUDGET)
                           FY85 $ 8.8M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to: (a) develop and validate
personnel testing procedures, (b) determine and measure specific requirements
for Air Force jobs, and (c) improve the process for matching individuals to
jobs.

The Air Force requires a continuing supply of quality personnel who can
operate and maintain sophisticated weapon and support systems. The manpower
and personnel research program incorporates two interrelated streams of
research designed to address the problems involved in acquiring and
maintaining a quality force by developing technology to enhance the selection,
assignment, training, and retention of that force.

In FY 84, efforts will be conducted to provide general approaches to
re-evaluating job entry aptitude requirements, and the specification and
evaluation of the impact of these changes on Air Force training and personnel
systems will be accomplished. Also, the development of task-level job
performance measurement techniques will continue, as will work on the Armed
Services Vocational Aptitude Battery (ASVAB) and the Air Force Officer
Qualifying Test (AFOQT). In FY 85, portable units for the testing of pilots
in operational units will be developed, and the transition of computerized
adaptive testing item pools will be completed. Retention factors which will
lead to improved selection system techniques will be identified in FY 85, and
measures of individual and organizational productivity will also be developed.

Efforts by the Air Force directed toward the improvement of the ASVAB and the
production of new forms of that test are directed, in part, by a tri-service
steering committee of General Officers. Similarly, efforts concerned with the
development of computerized testing techniques for eventual implementation at
Military Enlistment Processing Stations are coordinated with the other
services through a triservice steering committee. Air Force responsibilities
lie principally in the development of test items suitable for computer
implementation. Efforts across all services to develop job performance
measures are coordinated by a working group monitored by the Office of the
Assistant Secretary of Defense/Manpower, Installations and Logistics
(OASD/MI&L). Close coordination is maintained both at the working level and
by laboratory management with other services. Exchange of proposed statements
of work for contractual efforts, wide dissemination of technical reports, and
symposia and meetings attempt to ensure that work conducted within this
Program Element does not duplicate work conducted by the other service
laboratories.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include the provision of: (a) improved
means to measure and evaluate job performance and link enlistment standards
to on-the-job performance, (b) models and strategies to improve retention,
and (c) comprehensive skills management and re-enlistment/career assignment

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programs.

Immediate benefits of this Program Element are technologies which will aid personnel acquisition and the optimal assignment of individuals best qualified for particular jobs. Longer term benefits include an accessions system more attuned to Air Force needs, reduction in training turnover and costs as a function of reduced attrition in training, and increased retention of quality personnel. This research will lead to the better utilization of Air Force personnel.

FUTURE DIRECTIONS:

In the future, this research will: (a) continue updating and refining the ASVAB, (b) develop and refine further required ASVAB subtests, (c) continue developing, demonstrating, and evaluating computer systems for use in selection and classification, (d) further refine the AFOQT, (e) continue with the detailed assessment of job specifications and skill requirements, (f) evaluate a variety of personnel assignment algorithms, and (g) compile a data bank pertaining to a wide variety of historical and current occupational information.

PROJECT OVERVIEW

	84	85
PROJECT: O6HP	LABORATORY SUPPORT	$ 4.0M $ 4.1M

PE: 62703F   PERSONNEL UTILIZATION TECHNOLOGY

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to provide for part of the operating and
maintenance costs of the Air Force Human Resources Laboratory at Brooks Air
Force Base, Texas, including pay and related costs of civilian scientists and
support personnel, transportation, rent, communications, utility costs,
procurement of supplies and equipment, and contractor support services.

The laboratory performs research, exploratory development, and advanced
development in the manpower, personnel, training, human factors, and
human-oriented logistics R&D areas in support of immediate and potential
needs of the Air Staff and Air Force operational commands. This Project
supports and complements all Projects within Program Element 62703F.

PAYOFF/UTILIZATION:

The payoff of this Project involves the provision of operational and
maintenance support to the many and varied research tasks of the Air Force
Human Resources Laboratory at Brooks Air Force Base, Texas.

PROJECT OVERVIEW

		84	85
PROJECT: 7719	FORCE ACQUISITION AND DISTRIBUTION SYSTEM	$ 2.4M	$ 3.6M
PE: 62703F	PERSONNEL UTILIZATION TECHNOLOGY		
CONGRESSIONAL CATEGORY:	MANPOWER & PERSONNEL		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to provide Air Force personnel managers with the technology, managerial tools, and data to enhance the Air Force's selection, assignment, and classification systems.

Since the quality and quantity of service-eligible young people is anticipated to decline significatly over the next decade, research to improve Air Force manpower and personnel systems is required. Previous work under this Project involved: the development of an experimental test battery containing measures of visual-motor and information-processing skills, the initiation of a Training Decisions System to provide automated procedures to assist decision-makers in addressing fundamental training management issues, and a large effort to measure the basic skills requirements of Air Force jobs and the functional skills of individuals.

To properly place individuals in jobs that suit their abilities, it is necessary to have a complete description of the tasks performed in each job and their relative difficulties. These job/task requirements can then be related to the abilities of incoming personnel. Under this Project, person-job matching will be expanded from its current use as a first assignment tool to assignments throughout enlisted members' careers. Examinations of job characteristics and requirements and the relations of those parameters to the characteristics and abilities of successful and unsuccessful job incumbents will continue to be assessed through the use of manpower management and policy models. The large increase in funding for this Project is in response to a significant increase in research needs from the using commands, and reflects the importance of maintaining and improving personnel management and effective personnel utilization within the Air Force.

In FY 84, the general approaches provided by this effort will be transitioned to advanced development Projects. The specification and evaluation of the impact of changing job entry aptitude requirements on the training and personnel systems will be accomplished. Also in FY 84, three comparable versions of the Armed Services Vocational Aptitude Battery (ASVAB) and a new version of the Air Force Officer Qualifying Test (AFOQT) will be completed and implemented. These efforts will continue through FY 85, providing technologies for transition to the 6.3 Basic Skills Project which will develop basic skills assessment and enhancement packages. During FY 85, portable units will be developed which will provide for the testing of pilots in operational units as well as at OTS, ROTC, and AFA locations. This data will be used to validate the experimental battery of tests for pilot selection. Measures of these abilities, which are not typically assessed through conventional paper-and-pencil tests, will be evaluated for their usefulness in improving the selection of pilot trainees and the subsequent assignment of pilots to specialized training tracks. Also during FY 85, the transition of computerized adaptive testing item pools will be completed and

strength, stamina and aptitude requirements for Air Force jobs will be identified.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the eventual streamlining of the Air Force training system, which will permit decision-makers to maximize training resource allocation and result in cost savings related to a more efficient training system, (b) the improved matching of Air Force personnel to jobs which most closely relate to their aptitudes, interests, and skills, (c) the enhancement of combat readiness through efforts to ensure that Air Force personnel have the skills necessary to perform successfully in peacetime and combat, (d) the accumulation of complete descriptions of all Air Force specialties, (e) a reduction in pilot training attrition resulting in significant cost and resource savings, and (f) the likely adoption of improved testing techniques by the other services.

PROJECT OVERVIEW

		84	85
PROJECT: 7734	FORCE MANAGEMENT SYSTEM	$ 0.6M	$ 1.2M
PE: 62703F	PERSONNEL UTILIZATION TECHNOLOGY		
CONGRESSIONAL CATEGORY:	MANPOWER & PERSONNEL		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to develop strategies and techniques to
achieve the improved management and higher retention of qualified Air Force
personnel.

As economic conditions improve, retention of highly qualified, well-trained
personnel will become increasingly difficult as the Air Force must compete
with the private sector for a shrinking pool of qualified personnel. To
improve retention, make the most effective use of assigned airmen, and
maintain a constant state of readiness, more sophisticated techniques are
required to manage Air Force personnel resources under all potential
conditions.

In FY 84, the development of task-level job performance measurement
techniques will continue, with an expected transition to advanced
development. In FY 85, the development of on-the-job performance measures,
against which selection devices will be validated, will continue. Also in FY
85, retention factors which will lead to improved selection systems will be
identified, and measures of individual and organizational productivity will
be developed.

The Congressional mandate to link enlistment standards to on-the-job
performance measures has resulted in close monitoring of this significant
effort by the Office of the Assistant Secretary of Defense/ Manpower,
Installations and Logistics (OASD/MIL). These efforts are in direct response
to the FY 84 Authorization Bill language which directs DoD to fence, if not
enhance, development of models and procedures to enhance retention of Air
Force personnel.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the development of task-level job
performance measurement techniques and on-the-job performance measures which
will allow for the improvement and validation of needed Air Force personnel
selection devices, (b) the development of reliable individual and
organizational productivity measures, and (c) the identification of retention
factors which will lead to improved selection systems.

A major component of the Air Force budget is personnel costs, and a primary
contributor to personnel life cycle costs is the attrition of first-term
personnel. Cost savings can be realized by enlisting personnel who are most
likely to complete their initial tours and by increasing the probability of
favorable career decisions at the end of their initial tours. The refinement
of screening and selection techniques, and the more detailed and accurate
specification of job requirements and job performance measures should help to
reduce first-term losses and overall attrition. The development of improved

personnel selection and management techniques will result in reduced
personnel and training costs and improved job satisfaction, productivity, and
retention.

PROGRAM ELEMENT OVERVIEW

PE: 63227F   ADVANCED SIMULATOR TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

FUNDING: FY84 $ 6.7M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 6.4M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to: (a) support simulator and
training device technology, and (b) develop subsystems to improve the
performance capabilities of flight simulators, with special emphasis on
developing and demonstrating improved visual image generation and visual
display techniques to provide more adequate visual displays for combat
mission training.

Currently, air-to-air, air-to-ground and terrain-following fighter aircraft
simulator training is severely limited by the lack of visual scene detail and
complexity, and display brightness, resolution, and field-of-view (FOV). In
the image generation area, advanced image generation technology with greatly
enhanced scene detail and complexity will be developed and demonstrated to
evaluate the training effectiveness of these more complex and realistic
scenes. In the visual display area, significant improvements in display
resolution, brightness, and FOV are required for critical Tactical Air Force
training.

There will continue to be close coordination between the Army, Navy, and Air
Force on simulation development for training purposes. The Air Force Human
Resources Laboratory (AFHRL), as the Air Force Systems Command laboratory
focal point for training simulation technology, closely monitors all
significant research and development being conducted by other DoD, National
Aeronautics and Space Administration, and industrial organizations to
eliminate redundancy. A major interservice cooperative effort involves a
jointly funded effort with the Army Program Manager for Training Devices to
develop improved light-valve projector technology, and improved computer
image generation (CIG) systems. Close coordination within the Air Force user
community is also ensured by annual research and development coordination
meetings between AFHRL, the Aeronautical Systems Division, and the Major
Commands.

In FY 84 and FY 85, the development, fabrication and evaluation of advanced
CIG systems will continue. The Advanced Visual Technology System (AVTS) will
provide for the development, installation and testing of an advanced CIG
system on the Advanced Simulator for Pilot Training (ASPT). Multisensor,
fiber optic, helmet-mounted display capabilities for LANTIRN and other
sensor-equipped aircraft training will also continue to be developed and
evaluated.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include the development, fabrication and
evaluation of advanced CIG and display technologies for tactical aircraft
simulators.

These advanced capabilities will provide for improved pilot training through
the provision of simulated combat scenarios which are more varied and

realistic than those currently possible. The advances in CIG capability and display technology expected under this Program Element will result in the improved training effectiveness of the ASPT, and will provide for the advancement of flight simulation concepts for multisensor simulators. Additionally, this Program Element will pursue the further development and evaluation of fiber optic, helmet-mounted displays as they relate to the provision of portable and more cost-effective multisensor simulators for tactical aircraft training.

FUTURE DIRECTIONS:

In the future, complex, multisensor, multicockpit, combat mission training flight simulators will be developed. After the simulator hardware requirements for combat mission training have been fully explored, using the ASPT and related systems at AFHRL, a low-cost, potentially transportable Combat Mission Trainer (CMT) will be developed. This CMT will probably employ helmet-mounted visual display technology and microprocessor-based modular simulation subsystems for lower cost and small size. Ultimately, this CMT will be inexpensive enough so that it can be procured in large numbers for use in unit level training. This will provide for maximum combat and mission preparation training, in terms of meeting pilots' requirements for optimum densities of readily available training that ensures peak combat behavioral effectiveness.

PROJECT OVERVIEW

	84	85
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PROJECT: 2363 ADVANCED VISUAL TECHNOLOGY SYSTEM	$ 6.6M	$ 6.0M

PE: 63227F   ADVANCED SIMULATOR TECHNOLOGY

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objectives of this Project are to develop and install an advanced
computer image generation (CIG) system on the Advanced Simulator for Pilot
Training (ASPT).

The Advanced Visual Technology System (AVTS) represents a two-pronged
approach to advancing the state-of-the-art in visual simulation technology
and demonstrating its utility for critical Tactical Air Force (TAF) training
requirements. One effort will develop an advanced 10-channel CIG system that
will meet the TAF training requirements for scene detail and complexity.
Another effort will develop an advanced prototype visual display capable of
meeting the very demanding TAF training requirements for a large visual
field-of-view (FOV), high display resolution for finely detailed target
images (miniraster inserts), high scene brightness, and good contrast. The
combination of the Advanced CIG and advanced visual displays will produce a
research simulator which will be adequate to demonstrate and behaviorally
define the TAF simulator training requirements. The visual system design and
training effectiveness issues which will be evaluated with the new CIG and
projectors are: edge and circle feature density and utilization, texturing,
point feature density, object spacing and utilization, general data base
complexity and data requirements, maximum range for cue generation, shadows
and brightness gradients, planar versus non-planar terrain, edge smoothing,
area(s) of interest implementation (for fine detail), visual FOV, color,
contrast, display persistence, display resolution, geometric distortion,
inter-channel mismatch, and disparities between visual displays and other
cockpit displays (e.g., sensor, radar, etc.).

In FY 84, the development and fabrication of the advanced CIG system will be
completed. The AVTS CIG will be installed on the ASPT in late FY 84 with
interim light valve displays, so further research issues can be addressed. In
FY 85, an advanced visual display will be under development and evaluation of
the training effectiveness of the new CIG/interim light valve display system
will be performed. Also in FY 85, the head-slaved, helmet-mounted display
will be further refined and modified. These efforts will make the imagery
eye-slaved and produce an advanced prototype display.

PAYOFF/UTILIZATION:

The payoffs of this Project include the development and evaluation of an
advanced CIG system for the ASPT, and the development and demonstration of
advanced visual display technologies and capabilities to meet the very
demanding simulator training requirements of the TAF.

The improved visual system simulation technology to be developed under this
Project will provide for significant improvements to the tactical air combat

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simulator environment. This technology is expected to be of value for the
conduct of future, related research, and to contribute substantially to the
fulfillment of current TAF training requirements.

PROJECT OVERVIEW

		84	85
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PROJECT: 2743	ADVANCED SIMULATOR CONCEPTS	$ 0.1M	$ 0.5M
PE: 63227F	ADVANCED SIMULATOR TECHNOLOGY		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to advance flight simulation concepts by
developing advanced combat mission training demonstrations for tactical
aircraft.

These simulations will require multisensor, multicockpit combat mission
training simulators. The required simulator capabilities will be initially
demonstrated using the Advanced Simulator for Pilot Training (ASPT) and the
Advanced Visual Technology System (AVTS) when the advanced visual displays
are installed. The LANTIRN R&D sensor simulation capability will provide the
basic multisensor simulation technologies.

In FY 84, the breadboard fiber optic helmet-mounted display will be evaluated
and specifications will be developed for a more advanced model. Development
of the LANTIRN and the multisensor simulation capability will continue. In FY
85, the advanced helmet-mounted display will be actively developed under
Project 2363, while the LANTIRN and related multisensor simulation
capabilities will be completed under this Project. Also in FY 85, the initial
ASPT hardware configuration designs for a multisensor, multicockpit combat
mission training capability at the Air Force Human Resources
Laboratory/Operations and Training Division (AFHRL/OT) will be developed.

PAYOFF/UTILIZATION:

The payoff of this Project involves the advancement of flight simulation
concepts, such that newly developed simulation and display technologies for
the ASPT, AVTS and other simulation systems and subsystems may be used to
their fullest.

Air combat training simulators effectively contribute to the development and
advancement of pilots' tactical air combat skills by providing complex and
realistic combat scenes for training. This research effort will augment the
development and effective utilization of such simulation training devices by
providing for advanced combat mission training concepts and demonstrations
for tactical aircraft simulation training.

PROGRAM ELEMENT OVERVIEW

PE: 63231F   CREW SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

FUNDING: FY84 $ 1.3M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 4.0M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide advanced development and
demonstration of concepts to protect and extend the performance of the
crewman in the hazardous aerospace environment.

Weapon system development has reached the point where the operator may become
the limiting factor in total system performance. The performance envelope of
the weapon system exceeds man's capability to perform in that environment.
Information available for the system operator concerning the status of the
weapon system is so complex and fluid that it can exceed his ability to
perceive, decide, and act upon the information. Modern aircraft tactics and
mission scenarios continually place the operator in environments from which
there is low probability of successfully escaping in an emergency. Mental and
physical demands can place the operator in situations from which he can not
recover. Work under this Program Element will demonstrate the capability to
safely egress aircraft at the extremes of the performance envelope and will
develop methodology to maximize decision making by the system operator or
manager.

The Projects under this Program Element interact with materials and
electronics technology development conducted in other laboratories. Projects
2830 (Advanced Life Support Systems) and 2868 (Crew Escape Systems
Technology), though still under Program Element 63231F, are no longer
considered to be within the Manpower Personnel and Training Research and
Development area. Formal agreements exist and joint participation in steering
groups assure development phasing and goals are compatible. Technology will
transition to the Aeronautical Systems Division, principally the Life Support
Program Office, for full-scale engineering development. In addition, life
support activities of the three military services are coordinated through the
tri-Service RDT&E Steering Group reporting to the Joint Logistics Commanders.

In FY 84, contractual efforts to apply human factors engineering concepts to
the design of manned airborne weapon systems will begin. The detailed design
of advanced life support technologies for aircrewman will also be initiated,
and work on expanding the safe ejection envelope to the extremes of modern
mission scenarios will be pursued. In FY 85, interim demonstrations and
evaluations of these technologies will be conducted.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include advances in life support
equipment technology which will increase aircrew protection and performance.
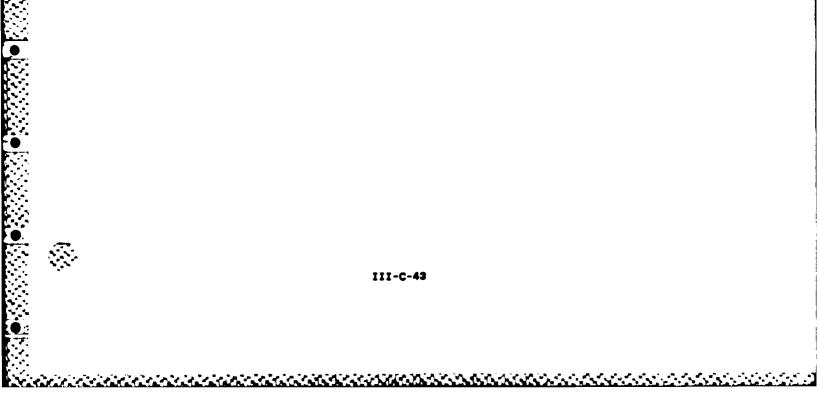
Protecting and sustaining pilots and aircrews is vital for maintaining a
combat effective aeronautical force. Excessive gravitational force,
insufficient oxygen, or unconventional enemy weapon threats may endanger
aircrew safety or decrease survivability. This limits or prohibits the
successful execution of a pilot's tactical skills in combat situations, and

ultimately, the potential for combat mission success. Work under this Program Element will result in the reduction or elimination of such threats and restraints.

FUTURE DIRECTIONS:

Future work under this Program Element will lead to the further development of needed tools and methodologies related to the simulation of aircraft and aircrew performance in hazardous situations. The development and evaluation of advanced life support equipment will continue, towards the aim of assuring maximal aircrew survivability and combat mission success.

PROJECT OVERVIEW

	84	85
PROJECT: 2829 COCKPIT AUTOMATION TECHNOLOGY (CAT)	$ 1.3M	$ 4.0M

PE: 83231F   CREW SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AEROSPACE MEDICAL DIVISION

PROJECT SYNOPSIS:

The objectives of this Project are to develop and validate the necessary tools and procedures to permit for the first time the extensive application of human factors design principles in the development cycle of manned airborne weapon systems.

This was a new start in FY 84. Currently, there are no organized criteria or procedures to allocate functions between the airborne crew members and the automated systems. Hence, the quantitative appraisal of the need for a given automated technology in terms of its contributions to workload control, survivability, performance, and cost is not available. Selection of the appropriate mix of automated technologies needed by the crew to respond to projected mission scenarios requires a structured, human-centered approach.

In FY 84, the design phase for the Project will begin with a multiple award to a multidisciplinary team of contractors. Detailed analyses characterizing critical tactical mission functions will be employed. Candidate crew system methodology procedures will be designed to support the mission oriented issues identified. In FY 85, these initial contractor efforts will be completed with demonstrations conducted to demonstrate the efficacy of the initial portions of their respective designs.

PAYOFF/UTILIZATION:

The payoffs of this Project include the publication of a guide for both Air Force and contractor personnel to aid in the design, selection, and configuration of automated technologies for manned airborne weapon systems.

The early application of this crew system design process will aid in determining the best use for automation based on pilot and aircrew needs. It will enable the concurrent design of aircrew training devices, and reduce the extensive cost associated with engineering change proposals and retrofits due to the limited design insight available from current techniques. Work under this Project will help to resolve the operator/manager task overload problem in the cockpits of modern sophisticated tactical aircraft by developing criteria through a systems approach which allocates functions between the crew member and automated systems based upon quantitative terms of performance and cost. This Project will provide the multidisciplinary process for analysis of alternative strategies in automation.

PROGRAM ELEMENT OVERVIEW

PE: 63365F   SPACE BIOTECHNOLOGY

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

FUNDING: FY84 $ 0.0M (FY85 PRESIDENT'S BUDGET)
                                  FY85 $ 0.7M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to: (a) fulfill the near-term
requirements described in PE 35171F, Space Launch Support, and PE 63402F, for
the Space Test Program, and (b) respond to the requirements of optimally
integrating man into future military space systems as manned support and
strategic space missions become realized.

This is a new start in FY 85, and is the only DoD program identified which
addresses the R&D requirements to exploit man's capabilities for military
space mission enhancement. In support of PE 35171F, biotechnology research
and development will be conducted to provide input to the Space Division
Manned Space Flight Engineer Program. In support of PE 63402F, work will
focus on the exploitation of the Space Shuttle platform to determine man's
capabilities for military application in space.

In FY 85, a contractual effort will be initiated to define man's utility in
select military space operations. The contract will eventually provide a
military functions model and a space human factors design handbook. In-house
efforts will concentrate on exploiting the shuttle to assess man's utility in
visual and tracking tasks, manned control functions, and performance
decrements. A series of shuttle experiments is planned.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) a military functions model
related to space applications, (b) a space human factors design handbook, (c)
exploitation of the Space Shuttle platform to assess man's utility in
tracking operations, manned control functions, and the minimization of
performance decrements, and (d) the acquisition of new biotechnology research
findings related to the optimization of man's integration into future
military space systems.

FUTURE DIRECTIONS:

In the future, work under this Program Element will examine specific military
space missions for effective, cost-efficient manned systems. Specific efforts
will concentrate on the design of space systems for manned maintenance and
calibration in addition to demonstrations of visual capabilities and an
acquisition tracking system. Crew protection systems developed by the
National Aeronautics and Space Administration (NASA) will be assessed for the
expected military orbital environments.

PROJECT OVERVIEW

		84	85
PROJECT: 2992	SPACE BIOTECHNOLOGY	$ 0.0M	$ 0.7M
PE: 63385F	SPACE BIOTECHNOLOGY		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AEROSPACE MEDICAL DIVISION		

PROJECT SYNOPSIS:

The objective of this Project is to exploit and optimize man's utility in
military space systems.

The Project effort addresses two major functional areas: man-machine
integration and crew protection. This effort supports the tasking objectives
iterated in the Air Force System Command's Space Plan, 30 December 1982. With
respect to man-machine integration, the objective is to enhance man's
effectiveness in military space systems, whether he be ground-based or
space-based. Human engineering concepts must be employed to optimize the
performance of the integrated man-machine system for performing military
missions in space. This factor becomes extremely critical for military
systems which involve conflict management. In the crew protection function,
the objective is to ensure crew protection and survivability in the military
space-based environment with particular emphasis on those stressors
associated specifically with military systems. This effort will start in FY
85.

In FY 85, work will focus on the elaboration of man's potential roles in
military space systems as well as a quantification of his capabilities to
·successfully perform projected military missions. Analyses will also be
conducted to consider the trade-offs of manned versus unmanned space systems.

PAYOFF/UTILIZATION:

The payoffs of this Project include the generation of findings concerning the
benefits of manned versus unmanned military space systems.

The Project will support the clearer definition of man's potential roles and
utility in military space systems, and will provide for quantified data
concerning his capabilities to successfully perform in projected military
space missions.

PROGRAM ELEMENT OVERVIEW

PE: 63704F   MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING
                              MANPOWER & PERSONNEL

DoD ORGANIZATION: AF

FUNDING: FY84 $ 0.8M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 2.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide technologies which will
aid in the successful selection, classification, training and assignment of
Air Force and other military and civilian personnel.

The Air Force requires enhanced manpower and personnel management systems in
order to effectively and efficiently provide a continuing supply of quality
men and women for Air Force jobs. Complex force composition and training
policy decisions require detailed information which can be provided by
manpower and personnel systems technology. To optimally select and classify
individuals, the Air Force and DoD must use validated tests. The Air Force is
the executive agent for the continuing development of multiple versions of
the Armed Services Vocational Aptitude Battery (ASVAB) and the Air Force
Officer Qualifying Test (AFOQT).

In FY 84 and FY 85, efforts under this Program Element will develop: (a)
multiple versions of the ASVAB for selection and classification of DoD
enlisted members, and of the AFOQT for selection of Air Force officers, (b)
measures to evaluate the performance of members in enlisted, officer, and
civilian jobs, (c) an adanced, job analytic system to specify tasks performed
on the job, and (d) models for use in manpower policy formulation and
training systems evaluations.

PAYOFF/UTILIZATION:

The payoffs of this Program Element are the development and validation of
methods which will lead to the more accurate selection and classification of
individuals and ensure optimal matches of individual aptitudes and job
requirements.

More specific payoffs include: (a) advancement of the primary job analytic
system in use by the Air Force, (b) provision for improvements in training
effectiveness and management, and (c) models to use in manpower policy
formulation and training systems evaluations.

FUTURE DIRECTIONS:

The Air Force will continue to pursue the enhancement of its manpower and
personnel management systems in order to effectively and efficiently provide
for a steady supply of quality men and women to Air Force jobs.

PROJECT OVERVIEW

		84	85
PROJECT: 2922	PERSONNEL ASSESSMENT SYSTEMS	$ 0.5M	$ 1.3M

PE: 63704F   MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) develop technology to identify, select, train, and assign individuals who are capable of mastering complex technical skills, including new systems which would provide currently unavailable information on individual job performance, (b) develop technology to obtain task-level measures of on-the-job performance, in order to validate selection and classification measures, assess training outcomes and evaluate the effects of organizational, environmental, and motivational factors, and personnel policies, on job performance, (c) develop job performance measures for enlisted members, officers, and civilians, and (d) provide procedures to HQ USAF/MP for use by trained evaluators. The procedures will be of a generic nature to foster use across Air Force specialties.

In FY 84 and FY 85, civilian job performance measurement will be initiated and developmental efforts for enlisted and officer measures will continue. Replacement of service tests and test batteries is required to avoid obsolescence, guard against test compromise, and incorporate improvements identified in the ongoing service's test research programs. Additionally, the Armed Services Vocational Aptitude Battery (ASVAB) must serve the needs of all the Services. As the DoD Executive Agent for ASVAB development, the Air Force frequently revises the test battery to protect against compromise and to incorporate research findings. Cyclic production of operational test revisions (e.g., ASVAB and aircrew selection tests) has been directed by DoD and their validation against performance measures has been mandated by Congress. Also in FY 85, this Project will begin new versions of the ASVAB, including the high school version of the ASVAB, and will test various aircrew selection tests.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) replacement of service tests and test batteries to avoid obsolescence, guard against test compromise, and incorporate improvements identified in ongoing service test research programs, (b) cyclic production of operational test revisions (e.g., ASVAB and aircrew selection tests) and their validation against performance measures as mandated by Congress, and (c) development of measures for validation of enlisted selection and promotion tests to reduce the risk of civilian class-action suits against the government, which could result in a cost avoidance of approximately $2.5 Million per year.

PROJECT OVERVIEW

		84	85
PROJECT: 2948	COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAM (CODAP)	$ 0.2M	$ 0.1M

PE: 63704F   MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to redesign the Comprehensive Occupational Data Analysis Program (CODAP), which is the current Air Force occupational analysis tool.

The CODAP system is rapidly becoming antiquated and difficult to maintain. An advanced development program is required to provide a top-down, structured approach to system redesign and reprogramming to make it more efficient, easier to maintain, and more user-friendly.

In FY 84, redesign of the system will begin. In FY 85, it is planned to: (a) complete improved and user-friendly occupational analysis software, (b) begin OT&E, and (c) start work on an innovative technique to provide job profile analyses.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) cost avoidance of over three million dollars per year, since FY 68 when the original CODAP was implemented, (b) state-of-the-art analytic, statistical, and reporting procedures, (c) techniques for longitudinal analyses of job content, (d) techniques for developing more job-related promotion tests, (e) techniques for matching weapon system acquisition tasks with related personnel skill requirements, and (f) critical task analysis techniques for use in job performance measurement, basic skills assessment and enhancement, and training resource allocation.

PROJECT OVERVIEW

		84	85
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PROJECT: 2949	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM	$ 0.0M	$ 0.4M

PE: 63704F   MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to provide a system to measure and train the
basic functional skills (literacy, arithmetic computation, dial and map
reading, etc.) required in Air Force enlisted specialties.

Because basic skill requirements for Air Force occupational specialties have
not been empirically derived and validated, there is no established
relationship between basic abilities and Air Force on-the-job performance.
Moreover, there are no data to indicate what additional (or substitute)
functional requirements may exist.

In FY 85 it is planned to: (a) validate basic cognitive occupational
requirements against job performance measures, (b) develop and validate basic
ability measures specific to identified occupational requirements, (c) design
and develop training packages, including program evaluation components, to
remediate job-specific personnel skill deficiencies, (d) develop a basic
skills technology management information system for tracking and managing the
system across all occupational specialties in the Air Force, (e) begin
initial building of instructional modules for identified job prerequisites,
and (f) develop basic skills enhancement training, testing and implementation
specifications.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) the reduction of marginal performers,
(b) reduced overall on-the-job training time, (c) increased numbers of
career airmen, and (d) more airmen with the skills necessary to perform well
on the job immediately after arrival.

Savings from reduced attrition could reach as much as $10 Million per year
and savings from increased productivity will approximate $5 Million per year.

PROJECT OVERVIEW

		84	85
PROJECT: 2951	TRAINING DECISIONS SYSTEM	$ 0.1M	$ 0.4M
PE: 63704F	MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY		
CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objective of this Project is to develop a training decisions system to use in making basic decisions regarding the what, where, and when of personnel training.

This will provide a more unified, practical, and integrated approach to such problems with all relevant data considered at once for certain basic training management decisions. Because of the scope of Air Force technical training, many decisions with major impacts on training are made, to some extent, independently and at different times, by management units responsible for different parts of the training and personnel systems. Coordinating such efforts is complex, and relevant data are not always available at key decision points when they are needed. For example, the content of resident technical school training is largely determined by predefined budgets, and whatever content is not covered in the school is left to on-the-job training (OJT), without systematic appraisal of long-term costs or OJT capacities.

In FY 84 this Project will design task characteristics data collection procedures and will begin data collection for the support of the training decisions system.

In FY 85 it is planned to complete necessary computer software design and development, continue data collection, and refine the training decision model.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) reduced training costs, (b) improved allocations of training content and resources, (c) demonstrably better alignment of training content with job task requirements, and (d) reduced training workload on operational Air Force units.

When operational, projected total savings plus cost avoidance are on the order of $50 Million per year, at a minimum. Initial significant savings are projected by mid-FY 86.

PROGRAM ELEMENT OVERVIEW

PE: 63751F   INNOVATIONS IN EDUCATION AND TRAINING

CONGRESSIONAL CATEGORY: HUMAN FACTORS
                              SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

FUNDING: FY84 $ 4.5M (FY85 PRESIDENT'S BUDGET)
                              FY85 $ 5.1M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objectives of this Program Element are to develop new ways of lowering
training costs while at the same time improving training effectiveness and
the skill levels of Air Force personnel.

Work under this Program Element will develop: (a) automated measures of
aircrew performance in flight simulators, (b) various types of maintenance
training simulators to use in training in place of operational equipment, (c)
a prototype replacement for the Air Force on-the-job training (OJT) system,
(d) a computer-based technical data system for maintenance technicians, (e) a
logistics model for use in predicting support requirements of new weapon
systems early in the design phase, and (f) a logistics model for improving
logistics planning by identifying wartime spares provisioning requirements
and scenario-driven training requirements.

There is a Memorandum of Agreement with the Military Airlift Command (MAC)
that outlines responsibilities for development of the pilot/aircrew
performance measurement system (PMS). The Air Force Human Resources
Laboratory (AFHRL) is working directly with the Air Training Command in the
demonstration and evaluation of the simulators for maintenance training. A
tri-service working group is assessing the total DoD effort in technology
development of simulation and maintenance training.

In FY 84 and FY 85, evaluations of the automated PMS for pilot performance in
simulator training will continue, and design guidelines for a variety of
simulators will be completed. Also, the evaluation of simulation capabilities
for maintenance training will continue, and specifications for a
computer-based system for technical maintenance aids will be developed. Work
on various subsystems of an integrated training management system (ITS) FOR
OJT will be initiated during this period, as will work on a unified data base
(UDB) for weapon system performance data. Project 2745, Logistics for Combat
Readiness Maintenance, will begin in FY 85, and will evaluate the suitability
of current maintenance capabilities to possible and future combat
environments.

PAYOFF/UTILIZATION:

The payoffs of this Program Element include: (a) the development of enhanced
and automated aircrew performance measures for flight simulation training,
(b) the development of specifications for low-cost maintenance training
simulators, (c) the development of a prototype, computer-based technical
information system for maintenance technicians, (d) the design and
development of a management information system for OJT, (e) a UDB of weapon
system performance data which can support planners, designers and
logisticians in the building of optimally supportable weapon systems, and (f)
improved methodologies for evaluating Air Force maintenance and support
capabilities in both peacetime and combat environments.

Overall, this Program Element will result in cost-effective training improvements and training technology developments, and improved maintenance and logistics systems for the Air Force.

FUTURE DIRECTIONS:

In the future, this Program Element will continue to pursue improvements and cost-savings in the training and management of Air Force personnel. Advancements in simulation technology can be successfully applied to the training of aircrew personnel and to the training and job performance of maintenance technicians. The further development and exploitation of computerization technology will be pursued under this effort, to help facilitate the management and improve the utilization of Air Force technical and combat personnel.

PROJECT OVERVIEW

	84	85
PROJECT: 2359	PILOT PERFORMANCE MEASUREMENT	$ 0.9M $ 0.0M
PE: 63751F	INNOVATIONS IN EDUCATION AND TRAINING	
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES	
DoD ORGANIZATION:	AF	
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY	

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) evaluate the utility of the
simulator performance measurement system (PMS), and (b) provide design
guidelines for the automated PMS for all types of Air Force simulators.

Currently, subjective assessments of aircrew proficiency are provided by
on-board flight instructors and/or examiners in both the simulator and the
aircraft. However, there are human limitations in the amount of information
an instructor can process at the same time. It is virtually impossible for an
instructor to monitor all the required actions and aircraft states which are
important for each phase of flight, particularly in multi-crew aircraft such
as the C-5. Also, there are limitations in terms of the degree to which
standardization can be achieved across the spectrum of instructors and
examiners. In previous work, the automated PMS for the C-5 simulator was
completed, and a training effectiveness evaluation of the simulator PMS was
conducted. Also, a study of the design requirements for an airborne PMS to be
installed on an operational C-5 aircraft was accomplished.

In FY 84, evaluation studies of the utility of the simulator PMS to the
Military Airlift Command will continue. In FY 85, design guidelines for all
types of simulators including fighters, ground attack, and
tanker/transport/bomber aircraft will be completed. This Project will be
terminated when these design specifications are completed.

PAYOFF/UTILIZATION:

The payoffs of this Project are the design, development and evaluation of an
automated PMS for use in airborne and all types of Air Force simulator
systems.

When the airborne PMS is used in conjunction with the C-5 flight simulator
PMS, it will provide for the collection of important data on the transfer of
training from simulators to aircraft. This system could result in the
reduction of the number of training flights required for Air Force personnel,
and could also increase pilot production. As well, specifications will be
generated to provide automated PMS design guidelines for future generation
simulation devices.

PROJECT OVERVIEW

		84	85
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PROJECT: 2361	MAINTENANCE TRAINING SIMULATION	$ 0.5M	$ 0.0M
PE: 63751F	INNOVATIONS IN EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objectives of this Project are to: (a) establish an information base that provides cost and instructional capabilities/requirements data for maintenance training simulators, and (b) demonstrate usable prototype simulators for maintenance training.

By using cost-effective maintenance simulation devices, the Air Force requirement for a hands-on capability can be met. Actual equipment that is used for training breaks down frequently, minimizing actual hands-on training time. The development of low-cost computers has made maintenance training simulation a viable alternative to the use of actual equipment for training equipment operators and maintainers. Since this technology is relatively new, an information base that matches training capabilities and provides cost data has not yet been established. A high-fidelity or very realistic simulator may cost more than the actual equipment, while a low-fidelity trainer may yield the desired training outcomes at a fraction of the cost of the actual equipment. Furthermore, simulation can provide a richer training experience through features like varied troubleshooting and fault location. However, instructional and equipment designers have little documentation on what works to aid them in their task. Information needed to determine the types and respective levels of simulator fidelity and procedural guidelines for simulator acquisition are required. Previous work under this Project included an evaluation of a flight simulator maintenance training device, and the completion of a low-cost and low-fidelity maintenance simulator employing computer graphics.

In FY 84, a training effectiveness evaluation will be completed, and all of the information obtained on the relationship of simulator design to training effectiveness and cost will be summarized in a final report. Final handbooks and model specifications will also be delivered at the end of FY 84.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) usable prototype simulators for the avionics courses at Lowry Technical Training Center, (b) documented experiences and data to assist instructional designers in acquiring simulators for new or existing weapon systems, (c) documentation, design guides, and specifications to assist those who will design the simulators, and (d) data to indicate what level of fidelity a simulator must have in order to attain specified training objectives.

PROJECT OVERVIEW

		84	85
PROJECT: 2362	COMPUTER-BASED MAINTENANCE AIDS	$ 0.7M	$ 0.7M
PE: 63751F	INNOVATIONS IN EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objectives of this Project are to develop, demonstrate and evaluate a prototype, deployable, intermediate maintenance, shop-level, computerized technical order (TO) system.

The Air Force Logistics Command needs a computerized, deployable technical information storage and retrieval system to improve maintenance performance in a mission readiness posture. The prototype TO system to be developed under this Project will include an interactive computer terminal to interface with a computer-based technical data system. The system will substantially reduce technical data search and retrieval time by the technicians and improve aircraft systems repair quality and time to completion. The system will present various difficulty levels of technical information based on the needs and abilities of the user. This Project will convert the current, paper-based TO system to a computerized format that can be used by technicians in the field.

In FY 84, development of the prototype computerized maintenance data system will be completed and tested for incorporation in the B-1B aircraft program. This evaluation will be completed and final specifications will be developed in FY 85.

PAYOFF/UTILIZATION:

The payoffs of this Project are: the development of a computerized, deployable technical information system for use by maintenance technicians in the field, and the conversion of the current, paper-based TO system to a computerized format.

A computer-based, technical data system should result in the improvement of the maintenance performance of individual technicians by providing more extensive and effective instructions and more immediately accessible and current data. This computer-based system could result in more time productively spent on actual maintenance tasks and an increase in the effective utilization of maintenance personnel. In turn, this will lead to shorter down times and a smaller proportion of weapon systems inoperable at a given time.

PROJECT OVERVIEW

		84	85
PROJECT: 2557	INTEGRATED TRAINING MANAGEMENT SYSTEM (ITS)	$ 1.2M	$ 1.9M
PE: 63751F	INNOVATIONS IN EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objectives of this Project are to modernize and make more efficient the current Air Force system and subsystems for monitoring, evaluating, and managing the conduct of personnel training and the needed revisions to training objectives and procedures.

The current on-the-job training (OJT) program is a manual, labor intensive system that is not responsive to operational needs. It is also limited by the excessive administrative burden it imposes and by the lack of an integrated approach to the support and conduct of job-site training. This Project will provide: (a) improved training management and simplification of administration, (b) improved identification and updating of training requirements, (c) improved evaluation techniques to ensure training quality control, (d) methodologies to determine the cost of OJT and the capacity of units to conduct OJT, and (e) better utilization of training resources.

In FY 84, work on the management, evaluation, personnel, computer support, and training delivery subsystems will be initiated. In FY 85, development of the management subsystem will continue and the training evaluation, personnel, training resource allocation, and training delivery subsystems will be completed.

PAYOFF/UTILIZATION:

The payoffs of this Project include the improvement of administrative methods and monitoring and evaluation methodologies for the Air Force's OJT programs.

Development and demonstration of cost and capacity analysis methodologies is an urgent Air Staff requirement and will have immediate impact on improved budget planning, training evaluation, and management. Development of techniques for more systematic definition of training requirements for OJT and improved task level proficiency evaluation procedures will have widespread application in ensuring that training objectives are being met. The design and demonstration of computerized scheduling, record keeping, and testing procedures will be directly applicable to the introduction of base-level management systems for improving the cost-effectiveness and flexibility of OJT management. These systems can be integrated with cost, capacity, and evaluation factors into a management information system for use at all levels of the OJT program up through Air Staff.

PROJECT OVERVIEW

		84	85
PROJECT: 2744	UNIFIED DATA BASE APPLICATION	$ 1.2M	$ 1.5M
PE: 63751F	INNOVATIONS IN EDUCATION AND TRAINING		
CONGRESSIONAL CATEGORY:	HUMAN FACTORS		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	AIR FORCE HUMAN RESOURCES LABORATORY		

PROJECT SYNOPSIS:

The objectives of this Project are to design and apply a prototype unified data base (UDB), which will be easy to use and will conform to the human factors needs of the users, to selected weapon systems in different stages of development.

The Air Force Logistics Command and system program offices have a common need for a UDB containing performance data on weapon systems from which planners, designers, and logisticians can build supportable weapon systems. Currently, there are various data bases which have different formats, are difficult to change, have limited use, and require a high level of skill to fully utilize. The data collected and technology used to collect the data for this Project will, in turn, support development of future weapon systems by guiding planners at each stage of the development process.

In FY 84, three systems in various stages of development will be selected as test-beds for the UDB. One system will be in the early design phases, another in the detailed design phase, and a third in the test and evaluation phase. The software to structure and manipulate the data base will also be developed. A sample data base for each of the three test-bed systems will be started in FY 84 and completed in FY 85. In FY 85, when the data base is completed, it will be tested and then used by all Air Force organizations involved in system development, test, and support. This phase will enable users to determine what changes need to be made to improve the utility of the UDB.

PAYOFF/UTILIZATION:

The payoff of this Project is the development of a UDB and related technology which will enable weapon system planners to more accurately estimate training needs and integrate training requirements in the early stages of weapon system development.

The UDB will enable the vast amount of logistics support data collected by the Air Force to be stored, retrieved, analyzed, and presented in a suitable and timely manner so that it can be optimally used in the design of new systems. Implementation of the UDB should result in cost savings in the design and development of new weapon systems, and improve the early specification of training requirements for such systems.

PROJECT OVERVIEW

		84	85
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PROJECT: 2745	LOGISTICS FOR COMBAT READINESS MAINTENANCE	$ 0.0M	$ 1.0M

PE: 63751F   INNOVATIONS IN EDUCATION AND TRAINING

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: AIR FORCE HUMAN RESOURCES LABORATORY

PROJECT SYNOPSIS:

The objective of this Project is to simulate combat scenarios in order to determine logistics and training needs based on maintenance demand rates and sortie generation requirements.

The Air Force needs to determine logistics and training requirements during wartime conditions. There are currently no analytical tools nor procedures to determine these requirements. As a result of this Project, computer simulation models and other analytical tools will be available for managers to use in assessing the combat capabilities of their maintenance organizations.

In FY 85, this Project will evaluate the capability of a peacetime unit to perform maintenance functions in a combat environment, thereby closely aligning peacetime operations and training with projected wartime requirements. Work will also be initiated on modeling the critical requirements for successful accomplishment of the war zone maintenance mission. Maintenance procedures which would be modified under combat conditions will be identified and their utility for increasing combat readiness will be evaluated with computer simulation models.

PAYOFF/UTILIZATION:

The payoffs of this Project include the development and evaluation of computer-based, analytic tools which can aid Air Force planners in the specification of maintenance requirements and maintenance training needs for wartime conditions.

Individuals in command and policy-making positions have expressed concern relative to the readiness and capability of the Air Force's combat ready flying units. While action has been taken to assess and measure a unit's combat preparedness in the operations area, no such action has been taken to assess or measure the logistics and maintenance capabilities of a unit designated as combat ready. This project will operationally test and validate technlogy to provide for: (a) the more accurate de _. mination of logistics requirements for a maintenance unit during wartime operations, (b) the improved performance of maintenance units during wartime operations, and (c) the improved capability of Wing Commanders and Deputy Commanders for Maintenance to measure and assess, in peacetime, the ability of the maintenance unit to perform its wartime responsibilities. As a result of this Project, peacetime operations and training will be more closely aligned with projected wartime requirements.

PROGRAM ELEMENT OVERVIEW

PE: 64227F   FLIGHT SIMULATOR DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: SIMULATION SYSTEM PROJECT OFFICE

FUNDING: FY84 $23.3M (FY85 PRESIDENT'S BUDGET)
                              FY85 $93.9M (FY85 PRESIDENT'S BUDGET)

PE SYNOPSIS:

The objective of this Program Element is to provide for engineering
development of aircrew flight simulator techniques and training devices.

This Program Element funds efforts to: (a) adapt flight simulation technology
developed in the laboratories and industry for satisfying current training
requirements, and (b) develop prototype training devices. Prototype training
devices and subsystems developed under this Program Element will be evaluated
for training effectiveness and supportability prior to follow-on production
decisions and/or acquisition. The FY 85 BES is the first in which flight
simulator programs have been incorporated into this Program Element to
enhance control and visibility within the Air Force, OSD, and Congress.

The Deputy for Simulators, Wright-Patterson Air Force Base, Ohio, is the
in-house organization responsible for the majority of this Program Element.
Remaining in-house efforts include several tasks within the Simulator
Development Activity Project.

In FY 84, some Project efforts within this Program Element will consist of:
(a) competitive development of the Weapon System Trainer (WST), (b)
completion of hardware and software integration for the T-5 and C-135
trainers, and (c) modification/development in-house of a limited interim
training device for the GBU-15.

In FY 85, some Project efforts within this Program Element plan to: (a)
complete the B-1B Weapon System Trainer (WST), (b) complete the Simulator
Update Development Project for the F-4 simulator refurbishment through
Preliminary Design Review, (c) initiate upgrade and development of the B-52
Weapon System Trainer Offensive Avionics Station (OAS) to the Block II
Configuration, and (d) deliver the limited infrared trainer for the GBU-15.

PAYOFF/UTILIZATION:

Payoffs for this Program Element include the following: (a) lower costs and
improved training effectiveness through a joint Air Force/Navy effort
researching the many diverse issues confronting designers developing
simulators for today's complex aircraft (this effort will make cost-effective
use of technology developed during the Tactical Combat Trainer (TCT) Project),
(b) elimination of much of the problem and expense associated with the
proliferation of unique transformation programs and subsequent updates of
Defense Mapping Agency (DMA) data through a joint development project
initiated through the Joint Logistics Commanders to develop a standard DMA
data base transformation program, (c) development of a training capability
for our front line fighters, the F-15 and F-16, through the F-15/F-16
Simulator for Air-to-Air Combat (SAAC) (the modified SAAC will provide
air-to-air combat training, allow more extensive tactics development for
these aircraft, and allow further R&D), (d) development of a training system

III-C-60

to meet the training needs of all B-1B crew members through the development
of the B-1B Weapon System Trainer (WST) (these trainers will be capable of
providing war order mission rehearsal), and (e) cost savings, improved
supportability, and increased effectiveness for flight simulator systems
through the Simulator Update Development which funds updates to simulator
systems including refurbishment and upgrade.

FUTURE DIRECTIONS:

In FY 86, the B-1B Weapon System Trainer (WST) program will include hardware
and software integration and subsystem testing. In FY 86/87, the B52-WST OAS
will be upgraded to the Block II configuration and delivered units modified.
In addition, the Undergraduate Pilot Trainer (UPT) camera model visuals will
be removed and the Computer Image Generation (CIG) systems will be delivered
to the field and integrated with the existing trainers.

PROJECT OVERVIEW

		84	85
		----	----
PROJECT: 2325	SIMULATOR DEVELOPMENT ACTIVITIES	$ 3.7M	$ 3.6M
PE: 64227F	FLIGHT SIMULATOR DEVELOPMENT		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	SIMULATION SYSTEM PROJECT OFFICE		

PROJECT SYNOPSIS:

The objective of this Project is to research the many diverse issues confronting designers to allow development of simulators for today's complex aircraft with lower costs and improved training effectiveness.

It continues joint Air Force/Navy efforts to complete the demonstration of a flight simulator visual system that will cost less than current systems through integration of existing components to test an eye-slaved, high resolution, high detail area-of-interest image inset into a lower resolution background. This approach uses components developed by the Singer-Link Corporation and by the General Electric Corporation. These efforts will make cost effective use of technology developed during the *Tactical Combat Trainer* (TCT) Project (funds for developing the TCT were removed during FY 82). Examples of other efforts to make use of existing technology to reduce the procurement costs and risks associated with flight simulation include: (a) investigation into simulation of advanced, high resolution, synthetic aperture radars that are being introduced into the inventory, (b) continuation of the investigation into the relationship between simulator handling qualities and pilot performance to effectively quantify and verify simulator performance requirements and to improve and shorten simulator testing (electronic warfare simulation testing), (c) investigation of prototype development efforts for application on simulators for advanced aircraft, and (d) development and evaluation of helmet-mounted visual displays.

PAYOFF/UTILIZATION:

The payoffs of this Project include: (a) lower costs and improved training effectiveness through the development of simulators for today's complex aircraft, (b) improvement of training session management and performance monitoring capabilities by the augmentation of existing simulators with special-purpose micro-computer-based displays and controls at the instructor station, and (c) the collection and application of flight data from the C-130E aircraft so that the simulation of aircraft dynamics in all modes of flight will be completely accurate.

PROJECT OVERVIEW

		84	85
PROJECT: 2769	SIMULATOR UPDATE DEVELOPMENT	$ 5.6M	$27.7M

PE: 64227F   FLIGHT SIMULATOR DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: SIMULATION SYSTEM PROJECT OFFICE

PROJECT SYNOPSIS:

The objective of this Project is to fund prototype development of
modifications and updates to simulators in the field.

As flight simulator systems age and technology changes, these systems become
increasing costly and difficult to support, typically due to non-availability
of spare parts. This Project funds updates to these systems to maintain and
improve their supportability and effectiveness.

In FY 84, this Project will: (a) complete hardware and software integration
for the T-5 and C-135 trainers, (b) conduct subsystem tests and in-plant
testing, (c) procure from the prime contracor sufficient data to allow a
competitive update for the F-4 simulator and replacement of the GP-4B
computer (The F-4 simulator computers require replacement because they are
obselete, are based on 20 year-old technology, cannot incorporate new
modifications, and are logistically unsupportable.), (d) award the contract
for the F-4 refurbishment, (e) issue a Request for Proposal to replace the
camera model terrain board system with a computer image generated visual for
the Undergraduate Pilot Trainer (UPT), and (f) modify/develop, in-house, a
limited interim training device for the GBU-15.

In FY 85, it is planned to: (a) complete development of the F-4 simulator
refurbishment through Preliminary Design Review, (b) complete acceptance
testing and begin student training on the T-5 and C-135 simulators, (c) award
the contract to replace the existing camera model terrain board system on the
UPT with a computer image generated system, (d) initiate upgrade and
development of the B-52 Weapon System Trainer Offensive Avionics Station to
the aircraft Block II configuration, and (e) deliver the limited interim
infrared trainer for the GBU-15.

PAYOFF/UTILIZATION:

The payoffs of this Project include improved supportability and effectiveness
of flight simulators in the field.

Updates to simulator systems are required because, as flight simulator
systems age and technology changes, they become increasingly costly and
difficult to maintain, typically due to non-availability of spare parts.

In FY 83, modification and update was initiated to the T-5 Simulator for
Electronic Warfare Trainers and the C-135 Operational Flight Trainer.
Development was completed through the Critical Design Reviews.

PROJECT OVERVIEW

		84	85
		----	----
PROJECT: 2851	STANDARD DMA DATA BASE TRANSFORMATION PROGRAM	$ 1.0M	$ 1.4M
PE: 64227F	FLIGHT SIMULATOR DEVELOPMENT		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	SIMULATION SYSTEM PROJECT OFFICE		

PROJECT SYNOPSIS:

The objective of this joint development Project, initiated through the Joint
Logistics Commanders, is to develop a standard Defense Mapping Agency (DMA)
data base transformation program. The program will convert standard digital
DMA data for presentation to the pilot (e.g., visual, radar, infrared). This
program will be provided as government furnished equipment (GFE) to simulator
manufacturers.

PAYOFF/UTILIZATION:

The payoff of this Project involves the provision of the standard Defense
Mapping Agency (DMA) data base transformation program, as government
furnished equipment (GFE), to simulator manufacturers. This will eliminate
much of the problem and expense associated with the proliferation of unique
transformation programs and subsequent updates.

PROJECT OVERVIEW

		84	85
PROJECT: 2901	B-1B WEAPON SYSTEM TRAINER (WST)	$ 9.7M	$51.0M
PE: 64227F	FLIGHT SIMULATOR DEVELOPMENT		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	SIMULATION SYSTEM PROJECT OFFICE		

PROJECT SYNOPSIS:

The objective of this Project is to develop the training system that the
Strategic Air Command requires to meet the training needs of all B-1B crew
members.

Tasks required to be taught include mission rehearsal training for takeoff
and landing, navigation, air refueling, threat analysis/countermeasures, low
level penetration, weapons delivery, and emergency procedures. Emphasis will
be placed on training tasks that cannot be accomplished in the aircraft and
in integrated crew training. These tasks include those related to safety of
flight, emergency procedures, emergency war order rehearsal, and others for
which a suitable training environment does not exist. A total of five Weapon
System Trainers (WSTs), which simulate all four crew positions, and two
Mission Trainers (MT), which simulate only the offensive and defensive
positions, will be procured. Further, a flight station, which consists of the
pilot and copilot stations only, will be delivered early and later integrated
and delivered as one of the five WSTs. Crews can be trained in either an
integrated or independent mode. Trainers will be capable of providing war
order mission rehearsal.

In FY 84, this effort provides for the competitive development of the WST
through the Preliminary Design Review (PDR) (Phase I). Source selection will
then be conducted to select the winning contractor to complete the WST
development and production for Phase II. The B-1B WST development is based on
a $300 million baseline program (FY 81 dollars).

In FY 85, the contract will be awarded to one of the two competing
contractors to complete Phase II, which includes completion of design,
development, test, and evaluation, and deployment of the WST. At contract
award, the logistics support concept (i.e., contractor or organic) will be
selected, and the contract will complete design of the WST and mission
trainer through Critical Design Review. Production options will be exercised
for two WSTs, the Software Support Center, and the Early Flight Station. The
estimating technique included both parametric and bottoms-up approaches.
These will be refined through contractor proposals.

PAYOFF/UTILIZATION:

The payoff of this Project is the development of a training system to meet
the training needs of all B-1B crew members. The training system will
emphasize integrated crew training and training tasks that cannot be
accomplished in an aircraft.

PROJECT OVERVIEW

		84	85
		----	----
PROJECT: 2902	T-46 OPERATIONAL FLIGHT TRAINER (OFT)	$ 0.2M	$ 8.2M
PE: 64227F	FLIGHT SIMULATOR DEVELOPMENT		
CONGRESSIONAL CATEGORY:	SIMULATION & TRAINING DEVICES		
DoD ORGANIZATION:	AF		
RESPONSIBLE ORGANIZATION:	SIMULATION SYSTEM PROJECT OFFICE		

PROJECT SYNOPSIS:

The objective of this Project is to develop the Operational Flight Trainer to support the T-46 training system.

The simulator will be developed as a complex, with each complex consisting of four T-46 cockpits, with both student and instructor positions, a two-man operator station, and a limited three-degree of freedom motion base to provide limited cueing for turbulence, stall warning/buffet, and touchdown. A total of eleven complexes will be procured. The visual system will be provided as government furnished equipment (GFE). The visual systems will be in place on the T-37 simulators at the time of deployment of the T-46.

PAYOFF/UTILIZATION:

The payoff of this Project is the development of the Operational Flight Trainer to support the T-46 training system.

PROJECT OVERVIEW

		84	85
PROJECT: 2903	F-15/F-16 SIMULATOR FOR AIR-TO-AIR COMBAT (SAAC)	$ 3.2M	$ 2.0M

PE: 64227F   FLIGHT SIMULATOR DEVELOPMENT

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AF

RESPONSIBLE ORGANIZATION: SIMULATION SYSTEM PROJECT OFFICE

PROJECT SYNOPSIS:
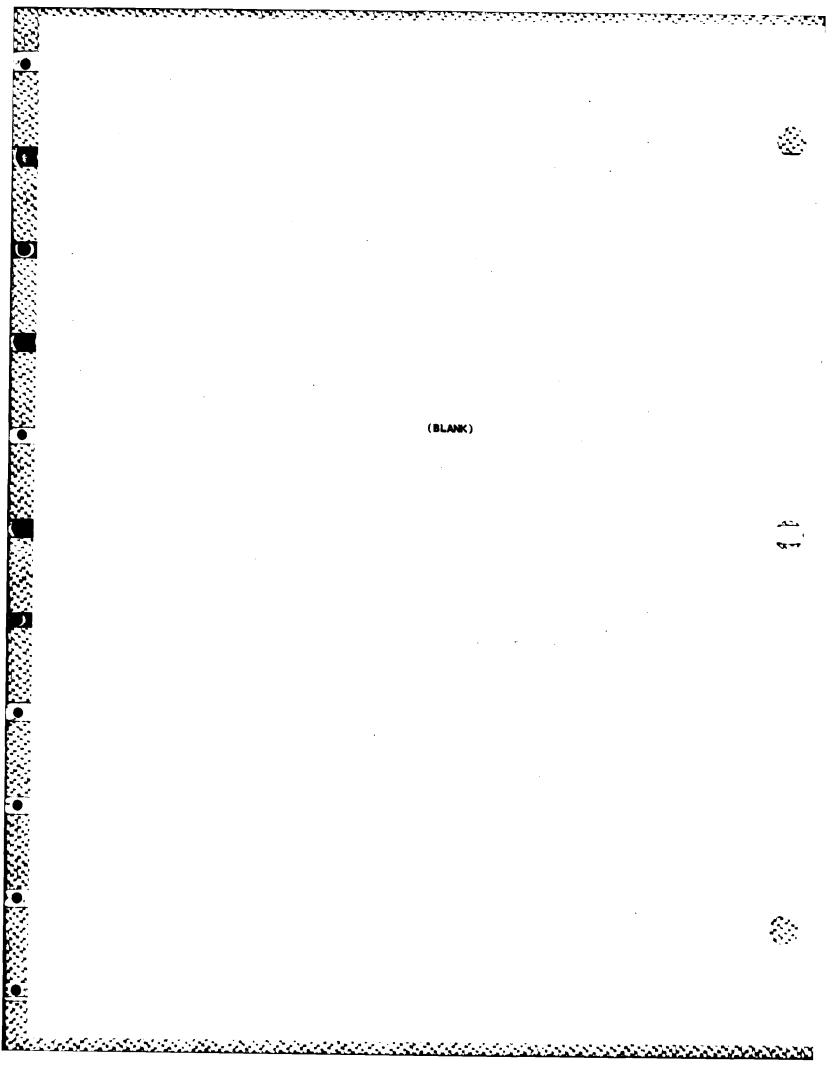
The objective of this Project is to provide a training capability for front line fighters, the F-15 and F-16.

The simulator for air-to-air combat (SAAC) is the only air-to-air combat trainer in the USAF. It has two full field of view visual systems configured with F-4 cockpits. The SAAC will be modified with both F-15 and F-16 cockpit configurations to provide air-to-air combat training, allow more extensive tactics development for these aircraft, and allow further research and development. The SAAC will be configured with a "Y" track to allow the cockpits to be interchanged. The F-15 cockpit will be incorporated by the second quarter of FY 85.

PAYOFF/UTILIZATION:

The payoff of this Project is the provision of a training capability for both the F-15 and F-16. The SAAC will be modified with both F-15 and F-16 cockpit configurations to provide air-to-air combat training, allow more extensive tactics development for these aircraft, and allow further research and development.

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102F						DEFENSE RESEARCH SCIENCES
2313-A4	AFOSR	1.187	1.225	HF	4	HUMAN FACTORS ENGINEERING
2313-A5	AFOSR	2.857	2.976	ST	6	VISUAL INFORMATION PROCESSING
2313-T1	AFHRL	0.550	0.550	ET	6	MANPOWER MANAGEMENT
2313-T3	AFHRL	0.280	0.280	ST	6	FLYING TRAINING RESEARCH
2313-V1	AFAMRL	0.225	0.225	HF	4	FUNDAMENTALS FOR MAN-MACHINE INTEGRATION
2313-V2	AFAMRL	0.425	0.425	ST	6	BASIC VISION RESEARCH
		5.524	5.681			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 61102F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	5.524	5.681

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62202F						AEROSPACE BIOTECHNOLOGY
O6MD	AMD	8.800	9.500	HF	V A R	AEROSPACE MEDICAL DIVISION LABORATORY OPERATIONS
6893	AMD	1.550	1.750	HF	4B	MANNED WEAPON SYSTEMS EFFECTIVENESS
7184	AMD	4.200	4.600	HF	4	MAN-MACHINE INTEGRATION TECHNOLOGY
		------	------			
		14.550	15.850			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62202F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	14.550	15.850

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
O6HT-1	AFHRL	1.615	1.642	ET	V A R	LABORATORY SUPPORT
O6HT-2	AFHRL	4.843	4.926	ST	V A R	LABORATORY SUPPORT
1121	AFHRL	2.250	1.800	ET	6	TECHNICAL TRAINING DEVELOPMENT
1123	AFHRL	2.745	2.800	ET	6	FLYING TRAINING DEVELOPMENT
1192	AFHRL	5.200	5.400	ST	6	ADVANCED SIMULATION FOR PILOT TRAINING
1710	AFHRL	4.124	4.300	HF	4	LOGISTICS AND MAINTENANCE TECHNOLOGY
3017	AFHRL	0.000	0.617	ET	6	COMMAND AND CONTROL TRAINING
6114	AFHRL	1.700	1.800	ST	6	FLIGHT SIMULATOR TECHNOLOGY
		------ 22.477	------ 23.285			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62205F :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62703F						PERSONNEL UTILIZATION TECHNOLOGY
06HP	AFHRL	3.999	4.042	MP	V A R	LABORATORY SUPPORT
7719	AFHRL	2.366	3.565	MP	2	FORCE ACQUISITION AND DISTRIBUTION SYSTEM
7734	AFHRL	0.635	1.150	MP	1	FORCE MANAGEMENT SYSTEM
		7.000	8.757			TOTAL IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62703F :			
THE PRESIDENT'S BUDGET, JANUARY 1984		7.000	8.757

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63227F						ADVANCED SIMULATOR TECHNOLOGY
2363	AFHRL	6.635	5.960	ST	6	ADVANCED VISUAL TECHNOLOGY SYSTEM
2743	AFHRL	0.096	0.441	ST	6	ADVANCED SIMULATOR CONCEPTS
		6.731	6.401			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63227F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	6.731	6.401

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63231F						CREW SYSTEMS TECHNOLOGY
2829	AMD	1.300	3.957	HF	4	COCKPIT AUTOMATION TECHNOLOGY (CAT)
		------	------			
		1.300	3.957			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63231F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	1.300	3.957

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63365F						SPACE BIOTECHNOLOGY
2992	AMD	0.000	0.701	HF	4	SPACE BIOTECHNOLOGY
		0.000	0.701			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63365F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	0.000	0.701

(CONTINUATION)

III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2922	AFHRL	0.500	1.242	MP	2	PERSONNEL ASSESSMENT SYSTEMS
2948	AFHRL	0.170	0.091	MP	3	COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAM (CODAP)
2949	AFHRL	0.000	0.360	ET	6	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM
2951	AFHRL	0.130	0.350	ET	6	TRAINING DECISIONS SYSTEM
		0.800	2.043			TOTAL IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63704F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	0.800	2.043

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III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2359	AFHRL	0.868	0.040	ST	3	PILOT PERFORMANCE MEASUREMENT
2361	AFHRL	0.500	0.000	ST	6	MAINTENANCE TRAINING SIMULATION
2362	AFHRL	0.700	0.700	HF	6	COMPUTER-BASED MAINTENANCE AIDS
2557	AFHRL	1.207	1.880	ST	6	INTEGRATED TRAINING MANAGEMENT SYSTEM (ITS)
2744	AFHRL	1.225	1.500	HF	4	UNIFIED DATA BASE APPLICATION
2745	AFHRL	0.000	0.981	HF	5	LOGISTICS FOR COMBAT READINESS MAINTENANCE
		4.500	5.081			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63751F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

(CONTINUATION)

III-C-1: LISTING OF AIR FORCE PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64227F						FLIGHT SIMULATOR DEVELOPMENT
2325	SIMSPO	3.650	3.620	ST	6D	SIMULATOR DEVELOPMENT ACTIVITIES
2769	SIMSPO	5.615	27.706	ST	6G	SIMULATOR UPDATE DEVELOPMENT
2851	SIMSPO	0.957	1.430	ST	6G	STANDARD DMA DATA BASE TRANSFORMATION PROGRAM
2901	SIMSPO	9.669	51.002	ST	6	B-1B WEAPON SYSTEM TRAINER (WST)
2902	SIMSPO	0.200	8.186	ST	6	T-46 OPERATIONAL FLIGHT TRAINER (OFT)
2903	SIMSPO	3.150	1.960	ST	6	F-15/F-16 SIMULATOR FOR AIR-TO-AIR COMBAT (SAAC)
		------	------			
		23.241	93.904			TOTAL IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64227F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	23.241	93.904

IV. OVERALL SYNOPSES AND PROJECT LISTINGS

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IV.A. CONGRESSIONAL CATEGORY SYNOPSES AND LISTINGS

Tables of project listings by Congressional Category follow each Congressional Category synopsis.

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CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY:	EDUCATION & TRAINING
DoD ORGANIZATION:	ARMY
CONTRIBUTING PROGRAM ELEMENTS:	61102A DEFENSE RESEARCH SCIENCES
	62722A MANPOWER, PERSONNEL AND TRAINING
	63743A EDUCATION AND TRAINING
	64722A EDUCATION AND TRAINING SYSTEMS

SYNOPSIS:

Education and training is a major function within the Army. Research and development directed at improved, more cost-effective education and training techniques is concerned with the range of training from individual skills to crew/team skills and into unit collective skills. At the most elementary level, the Army is required to provide various forms of compensatory education in reading and arithmetic skills for educationally-disadvantaged enlisted personnel. Research is directed at developing and evaluating methods that will prepare low aptitude personnel to profit from further Military Occupational Specialty (MOS)-oriented training. The application of modern computer technology for this purpose is also being studied.

A major thrust of the Army's research in this category is the investigation of skill acquisition and retention, with emphasis on operator, tactical and maintenance skills. This research is concerned with techniques for more cost-effective teaching of individual skills, as well as the investigation of how these skills are learned, how long it takes to learn them, and how long they can be retained without refresher training.

A focus of this program is the development and evaluation of training techniques and training programs that can be "exported" from Army schools to units in the field. Research is directed at improved crew and team training. Tactical training methods for combat arms units is also a major emphasis of this research. Air-ground engagement simulation and training at the National Training Center, Fort Irwin, CA, are special concerns.

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IV-A-1 : LISTING OF ARMY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102A						DEFENSE RESEARCH SCIENCES
B74F-1	ARI	0.882	1.500	ET	6	PERSONNEL PERFORMANCE AND TRAINING
	TOTAL:	0.882	1.500			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 61102A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.198	7.208

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IV-A-1 : LISTING OF ARMY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62722A						MANPOWER, PERSONNEL AND TRAINING
A791-2	ARI	3.606	4.352	ET	6	MANPOWER, PERSONNEL AND TRAINING
	TOTAL:	3.606	4.352			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62722A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	6.556	7.913

(CONTINUATION)

IV-A-1 : LISTING OF ARMY IN EDUCATION AND TRAINING

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            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

63743A                                        EDUCATION AND TRAINING

 A794-1     ARI          7.575 11.661 ET   6      EDUCATION AND TRAINING
                         ------ ------
            TOTAL:       7.575 11.661 (EDUCATION AND TRAINING IN PE)


   TOTAL FUNDING IN PROGRAM ELEMENT 63743A :            FY84    FY85
                                                        ------  ------
                   THE PRESIDENT'S BUDGET, JANUARY 1984  7.575  11.661

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IV-A-1 : LISTING OF ARMY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64722A						EDUCATION AND TRAINING SYSTEMS
D750	ARI	6.000	7.740	ET	6	EDUCATION AND TRAINING SYSTEM
	TOTAL:	6.000	7.740			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 64722A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	6.000	7.740

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: ARMY

CONTRIBUTING
PROGRAM ELEMENTS: 61102A DEFENSE RESEARCH SCIENCES

                            62716A HUMAN FACTORS ENGINEERING SYSTEM
                                   DEVELOPMENT

                            62717A HUMAN PERFORMANCE EFFECTIVENESS
                                   AND SIMULATION

                            63739A HUMAN FACTORS IN TRAINING AND
                                   OPERATIONAL EFFECTIVENESS

SYNOPSIS:

A principal objective of the work being done by the Army within this
category is to ensure the operability of major new weapons systems that
are in various stages of development and deployment. These new systems
represent major advances in potential battlefield effectiveness. They
also tend to be more complex than the systems they are intended to
replace. This complexity factor can generate increases in the skills
required on the part of the soldiers who must operate and maintain the
systems. Careful consideration of engineering options must be pursued
during the whole developmental sequence to ensure that these demands are
kept in balance with projected availability of personnel who have the
appropriate competencies. In some cases, it is even possible to enhance
the competencies of human operators by the way in which the system is
designed. For example, new flight controls for helicopters have been
designed so that the pilot can guide the aircraft with one hand; thus
freeing the other hand for the operation of other controls such as
armaments controls.

A second major objective under the Human Factors category is
survivability. The range of work directed toward meeting this objective
goes from the design of more effective boots for cold weather operations
to the development of methods for illuminating work areas at night that
are effective but not as readily detectable by hostile sensors. Specific
problems include such matters as working out the best balance between
the achievement of a low silhouette for armored vehicles while
maintaining their habitability and offensive effectiveness.

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IV-A-2 : LISTING OF  ARMY IN HUMAN FACTORS


              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
========================================================================


61102A                                           DEFENSF RESEARCH SCIENCES

 B74A         HEL         2.457  2.617 HF   4       HUMAN ENGINEERING

 B74F-2       ARI         0.751  1.591 HF   4       PERSONNEL PERFORMANCE AND
                          ------ ------              TRAINING

              TOTAL:      3.208  4.208 (HUMAN FACTORS IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 61102A :              FY84     FY85
                                                         ------   ------
                THE PRESIDENT'S BUDGET, JANUARY 1984     5.198    7.208

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(CONTINUATION)

IV-A-2 : LISTING OF ARMY IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62716A						HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT
AH70	HEL	9.825	11.468	HF	4	HUMAN FACTORS ENGINEERING SYSTEM DEVELOPMENT
	TOTAL:	9.825	11.468			(HUMAN FACTORS IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62716A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	9.825	11.468

(CONTINUED)

(CONTINUATION)

IV-A-2 : LISTING OF ARMY IN HUMAN FACTORS

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            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

62717A                                        HUMAN PERFORMANCE
                                              EFFECTIVENESS AND
                                              SIMULATION

  A790-1    ARI          1.551  1.910  HF  4   HUMAN PERFORMANCE
                                              EFFECTIVENESS AND
                                              SIMULATION
                         ------ ------
            TOTAL:       1.551  1.910 (HUMAN FACTORS IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 62717A :            FY84     FY85
                                                       ------   ------
                  THE PRESIDENT'S BUDGET, JANUARY 1984  3.877    4.776
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(CONTINUATION)

IV-A-2 : LISTING OF ARMY IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63739A						HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
A793	ARI	4.202	10.376	HF	4	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
	TOTAL:	4.202	10.376	(HUMAN FACTORS IN PE)		

TOTAL FUNDING IN PROGRAM ELEMENT 63739A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	4.202	10.376

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: ARMY

CONTRIBUTING
PROGRAM ELEMENTS: 61102A DEFENSE RESEARCH SCIENCES

        62722A MANPOWER, PERSONNEL AND TRAINING

        63731A MANPOWER AND PERSONNEL

SYNOPSIS:

The Army shares with the other Services the problem of overall force
management. The Army must efficiently recruit, select, and retain
adequate numbers and is pursuing a comprehensive research and
development strategy that can ensure that the most advanced tools for
doing so are in the hands of the Army's personnel managers and unit
leaders. However, the Army has its own particular points of emphasis.
Specifically, the concept of the combat unit has a special meaning in
the Army. The combat unit is the organization wherein the most severe
management problems are instigated but where the greatest opportunities
arise for the utilization of non-material incentives. Consequently, a
major thrust in the Army's R&D work under the Manpower and Personnel
category is directed toward the evaluation of alternative methods of
enhancing the individual's commitment to the Service and the unit, the
promotion of unit cohesion, and the maintenance of high levels of
morale. More cross-training between different sub-units within a combat
unit is one of the alternatives being evaluated.

Recent accomplishments in the overall effort under this heading include
the development of improved screening techniques at the recruiting stage,
at the stage of assignmetnt to training, and at the point of selection
of specific operational assignments (e.g., selection of tank gunners).
This work has also been fruitful in the development of methods for
selection of ROTC scholarship students and in Cadet evaluation and
Officer selection tests.

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IV-A-3 : LISTING OF  ARMY IN MANPOWER AND PERSONNEL


              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT   GOAL   PE/PROJECT TITLES
==================================================================================


61102A                                             DEFENSE RESEARCH SCIENCES

  B74F-3      ARI        0.756  1.000  MP    2      PERSONNEL PERFORMANCE AND
                         ------ ------                 TRAINING
              TOTAL:     0.756  1.000 (MANPOWER AND PERSONNEL IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 61102A :                 FY84      FY85
                                                            ------    ------
                THE PRESIDENT'S BUDGET, JANUARY 1984        5.198     7.208
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(CONTINUED)

(CONTINUATION)

IV-A-3 : LISTING OF ARMY IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62722A						MANPOWER, PERSONNEL AND TRAINING
A791-1	ARI	2.950	3.561	MP	2	MANPOWER, PERSONNEL AND TRAINING
	TOTAL:	2.950	3.561			(MANPOWER AND PERSONNEL IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62722A :		
THE PRESIDENT'S BUDGET, JANUARY 1984	6.556	7.913

(CONTINUATION)

IV-A-3 : LISTING OF ARMY IN MANPOWER AND PERSONNEL

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            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

63731A                                            MANPOWER AND PERSONNEL

 A792-1     ARI         9.825 17.026  MP   2      MANPOWER AND PERSONNEL
                        ------ ------
            TOTAL:      9.825 17.026 (MANPOWER AND PERSONNEL IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 63731A :              FY84     FY85
                                                        ------   ------
                  THE PRESIDENT'S BUDGET, JANUARY 1984  9.825   17.026

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CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: ARMY

CONTRIBUTING
PROGRAM ELEMENTS: 61102A DEFENSE RESEARCH SCIENCES

                            62717A HUMAN PERFORMANCE EFFECTIVENESS
                                   AND SIMULATION

                            62727A NON-SYSTEM TRAINING DEVICES
                                   (NSTD) TECHNOLOGY

                            63216A SYNTHETIC FLIGHT SIMULATORS

                            63738A NON-SYSTEM TRAINING DEVICES
                                   (NSTD) DEVELOPMENT

                            63744A TRAINING SIMULATION

                            64217A SYNTHETIC FLIGHT TRAINING SYSTEMS

                            64715A NON-SYSTEM TRAINING DEVICES
                                   (NSTD) ENGINEERING

SYNOPSIS:

The key objective for the Army's research on simulation and training
devices is combat readiness. This research and development effort is
directed at simulations and training devices that have an optimal degree
of fidelity to the "real world" of combat, yet remain relatively low
cost. The research requirement is to achieve devices that provide the
required transfer-of-training to the operational environment.

Advanced microelectronic technology must be exploited. Laser technology
has been adapted to the simulation of weapons effects, permitting
"force-on-force" engagements for land forces. These efforts will be
expanded to the simulation of air-ground engagements involving actual
aircraft. The simulated battlefield for realistic tactical training will
be "three dimensional". The application of computers and related
technology (e.g., video disks) for improved battle simulations (war
games) will also be a subject of research.

A concern in the development of simulators and training devices is
estimating the potential training effectiveness of a given device during
the design stage or assessing the potential relative effectiveness of
two or more design alternatives. Research will continue on the
development and evaluation of an empirical procedure for this purpose.
Research will also continue on procedures for improved "front-end
analysis" that will insure that a device, when developed, will meet the
user's needs.

Work will continue on the design and development of laser-based weapon
simulation capabilities.

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IV-A-4 : LISTING OF  ARMY IN SIMULATION AND TRAINING DEVICES


            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

61102A                                         DEFENSE RESEARCH SCIENCES

 B74F-4     ARI         0.352  0.500  ST   4     PERSONNEL PERFORMANCE AND
                                                 TRAINING
                        ------ ------
            TOTAL:      0.352  0.500 (SIMULATION AND TRAINING DEVICES IN PE)

  TOTAL FUNDING IN PROGRAM ELEMENT 61102A :                 FY84    FY85
                                                            ------  ------
                THE PRESIDENT'S BUDGET, JANUARY 1984        5.198   7.208

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(CONTINUED)

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62717A						HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
A790-2	ARI	2.326	2.866	ST	6	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
	TOTAL:	2.326	2.866			(SIMULATION AND TRAINING DEVICES IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62717A :		
THE PRESIDENT'S BUDGET, JANUARY 1984	3.877	4.776

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62727A						NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY
A230	PMTRADE	3.365	4.528	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) TECHNOLOGY
	TOTAL:	3.365	4.528			(SIMULATION AND TRAINING DEVICES IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62727A :		
THE PRESIDENT'S BUDGET, JANUARY 1984	3.365	4.528

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63218A						SYNTHETIC FLIGHT SIMULATORS
DB34	AVRADCOM	5.125	3.285	ST	6	ROTOR SYSTEM INTEGRATION SIMULATOR (RSIS)
DB39	PMTRADE	6.976	5.808	ST	6G	FLIGHT SIMULATOR COMPONENTS
	TOTAL:	12.101	9.093			(SIMULATION AND TRAINING DEVICES IN PE)

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63218A :			
THE PRESIDENT'S BUDGET, JANUARY 1984		12.101	9.093

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63738A						NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT
A224	PMTRADE	2.365	2.462	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARMOR/ANTI-ARMOR
A225	PMTRADE	0.000	3.638	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARTILLERY/AIR DEFENSE ENGINEER
	TOTAL:	2.365	6.100			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63738A :		FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984		2.365	6.100

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

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            PERFORMING  FY84   FY85 CONG
PE/PROJECT  ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

63744A                                        TRAINING SIMULATION

  A795      ARI        3.034  4.763  ST   6      TRAINING SIMULATION
                       ------ ------
            TOTAL:     3.034  4.763 (SIMULATION AND TRAINING DEVICES IN PE)
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	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63744A :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	3.034	4.763

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64217A						SYNTHETIC FLIGHT TRAINING SYSTEMS
D275	PMTRADE	12.719	14.134	ST	6	SYNTHETIC FLIGHT TRAINING SYSTEMS
	TOTAL:	12.719	14.134			(SIMULATION AND TRAINING DEVICES IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64217A :		
THE PRESIDENT'S BUDGET, JANUARY 1984	12.719	14.134

(CONTINUATION)

IV-A-4 : LISTING OF ARMY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715A						NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING
D237	PMTRADE	1.093	14.632	ST	6C	NON-SYSTEM TRAINING DEVICES - ARTILLERY/AIR DEFENSE/ENGINEER
D239	PMTRADE	0.000	0.985	ST	6C	NON-SYSTEM TRAINING DEVICES - INFANTRY
D241	PMTRADE	5.041	11.421	ST	6	NON-SYSTEM TRAINING DEVICES - COMBINED ARMS
D572	PMTRADE	2.840	1.477	ST	6	NON-SYSTEM TRAINING DEVICES - ARMOR/ANTI-ARMOR
D573	PMTRADE	3.571	6.015	ST	6B	PMTRADE AND NTEC SUPPORT
	TOTAL:	12.545	34.530			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 64715A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	12.545	34.530

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: NAVY

CONTRIBUTING
PROGRAM ELEMENTS.   61153N DEFENSE RESEARCH SCIENCES

                            62763N PERSONNEL AND TRAINING TECHNOLOGY

                            63720N EDUCATION AND TRAINING

                            63727N ADVANCED TECHNOLOGY FOR LOGISTICS
                                   INFORMATION

                            63732M MARINE CORPS ADVANCED
                                   MANPOWER/TRAINING SYSTEMS

SYNOPSIS:

The function fulfilled by work in the category of education and training
is the evolutionary development of the comprehensive educational system
for the Navy. The R&D effort supports innovation in the details of how,
when, and by what means instructional activities are carried out as well
as innovation in the overall management of the instructional process.

Problems being attacked include such matters as remedial education at
all levels (including the Naval Academy). The important matter of the
balance between formal, classroom training and less formal on-the-job
training is being closely examined and new techniques for independent
self-instruction are being developed.

The value of the effort is probably most cogently exemplified by the
developments in computer-aided instruction and computer-managed
instruction. In the first instance, the computer is used as the direct
means of conveying the lessons to the student. In the second instance,
the computer is used by both the student and instructor to assess
progress and to work out the best sequence of instructional experiences.
The Navy has been a pioneer in the development of these educational
tools and continues on the forefront of advance by supporting the rapid
exploitation of micro-processor technology that is already yielding more
instructional options at lower costs.

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IV-A-5 : LISTING OF  NAVY IN EDUCATION AND TRAINING


              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
==============================================================================

61153N                                          DEFENSE RESEARCH SCIENCES

  RR04206    ONR          4.317  6.292  ET  6        LEARNING AND TRAINING
                          ------ ------
             TOTAL:       4.317  6.292 (EDUCATION AND TRAINING IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 61153N :              FY84     FY85
                                                        ------   ------
               THE PRESIDENT'S BUDGET, JANUARY 1984     9.916   12.531

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(CONTINUED)

(CONTINUATION)

IV-A-5 : LISTING OF NAVY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62763N						PERSONNEL AND TRAINING TECHNOLOGY
F63-522	NPRDC	1.461	1.807	ET	6F	COMPUTER-AIDED EDUCATION AND CLASSROOM TRAINING
	TOTAL:	1.461	1.807			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62763N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.684	6.456

(CONTINUATION)

IV-A-5 : LISTING OF NAVY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63720N						EDUCATION AND TRAINING
Z1772	NPRDC	2.239	5.062	ET	6	EDUCATION AND TRAINING DEVELOPMENT
	TOTAL:	2.239	5.062			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63720N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.239	5.062

(CONTINUATION)

IV-A-5 : LISTING OF NAVY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63727N						ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION
T1805	NSRDC	0.000	5.023	ET	5	NAVY AUTOMATED PUBLISHING SYSTEM
T1806	NSRDC	0.000	2.171	ET	5B	LOGISTICS SYSTEMS INFORMATION NETWORK
W1032	NSRDC	1.697	3.339	ET	5D	NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM
	TOTAL:	1.697	10.533			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63727N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.697	10.533

(CONTINUATION)

IV-A-5 : LISTING OF NAVY IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63732M						MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS
C0867	HQMC	0.196	0.908	ET	6F	MARINE CORPS TRAINING RESOURCES DEVELOPMENT AND ANALYSIS
C1732	HQMC	0.098	0.083	ET	6F	USMC PROFESSIONAL MILITARY EDUCATION
	TOTAL:	0.294	0.991			(EDUCATION AND TRAINING IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63732M :		
THE PRESIDENT'S BUDGET, JANUARY 1984	2.109	3.018

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: NAVY

CONTRIBUTING
PROGRAM ELEMENTS: 61153N DEFENSE RESEARCH SCIENCES

                            62757N HUMAN FACTORS AND SIMULATION
                                   TECHNOLOGY

                            62763N PERSONNEL AND TRAINING TECHNOLOGY

                            63701N HUMAN FACTORS ENGINEERING

SYNOPSIS:

The purpose of the human factors R&D effort in the Navy is to ensure
that the match between man and machine is as close to perfect as
possible. The underlying assumption for most of this work is that it is
possible to design machines that are compatible with the capabilities
and limitations of those who will operate and maintain the machines. In
some cases, the process can be as straightforward as making sure that a
piece of equipment is accessible for maintenance; that the maintenance
technician does not have to remove half an aircraft's avionics gear to
replace a switch. The process gets much more intricate when we begin to
consider the best means for inter-communication between a CIC officer
and a computer that is supposed to track and select targets and provide
information on weapon status.

The elements of the work are often the displays and controls for each of
thousands of different machines but the work extends in important ways
to such matters as the overall layout of work spaces (such as cockpits),
the design of protective clothing and safety equipment and, most
recently, the management of the technical information used by operators
and maintenance technicians.

It should be noted that the work in human factors extends from the 6.1
level to the 6.3 level but not beyond to the prototype procurement
stage. That is because there are no human factors devices, as such. The
realization of the value of human factors comes when the design
recommendations are incorporated in prototype operational equipments.

Many successful applications have resulted from this work including the
remarkable development of voice-activated computer control functions.

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61153N						DEFENSE RESEARCH SCIENCES
RR04209	ONR	2.467	2.815	HF	4	ENGINEERING PSYCHOLOGY
WR04210	NAVAIR	0.320	0.340	HF	4	HUMAN FACTORS ENGINEERING
	TOTAL:	2.787	3.155	(HUMAN FACTORS IN PE)		

TOTAL FUNDING IN PROGRAM ELEMENT 61153N :		FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984		9.916	12.531

(CONTINUATION)

IV-A-6 : LISTING OF NAVY IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62757N						HUMAN FACTORS AND SIMULATION TECHNOLOGY
F57-525	NADC	3.265	3.725	HF	4	HUMAN FACTORS TECHNOLOGY
F57-701	ONR	0.365	0.405	HF	4B	SMALL BUSINESS
	TOTAL:	3.630	4.130	(HUMAN FACTORS IN PE)		

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62757N :			
THE PRESIDENT'S BUDGET, JANUARY 1984		7.309	7.987

(CONTINUATION)

IV-A-6 : LISTING OF NAVY IN HUMAN FACTORS

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            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

62763N                                        PERSONNEL AND TRAINING
                                              TECHNOLOGY

 F53-528    NPRDC        0.190  0.000  HF  2B    PERSONNEL PERFORMANCE
                        ------ ------             ASSESSMENT AND ENHANCEMENT
            TOTAL:       0.190  0.000 (HUMAN FACTORS IN PE)
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   TOTAL FUNDING IN PROGRAM ELEMENT 62763N :              FY84     FY85
                                                          ------   ------
                   THE PRESIDENT'S BUDGET, JANUARY 1984   5.684    6.456
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(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 (SM)	FY85 (SM)	CONG CAT	GOAL	PE/PROJECT TITLES
63701N						HUMAN FACTORS ENGINEERING
W0542	NADC	0.641	0.676	HF	4A	AIR HUMAN FACTORS ENGINEERING TECHNOLOGY
Z1771	NPRDC	0.551	1.186	HF	4	GENERAL HUMAN FACTORS ENGINEERING
	TOTAL:	1.192	1.862			(HUMAN FACTORS IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63701N :		FY84	FY85
	THE PRESIDENT'S BUDGET, JANUARY 1984	1.192	1.862

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: NAVY

CONTRIBUTING
PROGRAM ELEMENTS:

    61153N DEFENSE RESEARCH SCIENCES

    62763N PERSONNEL AND TRAINING TECHNOLOGY

    63707N MANPOWER CONTROL SYSTEMS
            DEVELOPMENT

    63732M MARINE CORPS ADVANCED
            MANPOWER/TRAINING SYSTEMS

    64703N TRAINING AND PERSONNEL SYSTEM
            DEVELOPMENT

SYNOPSIS:

The overall aim of the work in manpower and personnel is to solve or
ameliorate basic problems of having the proper numbers of competent
people at the right place at the right time to fulfill the Navy's
mission. This goal involves effective recruiting, testing, and
assignment. It also involves career management, both in the sense of the
individual's own career choices and in the sense of control over the
dynamic flow of thousands of individuals from stage to stage in the
process.

One of the major themes that ties this work together is the greatly
increasing use of computers to support the personnel management process.
At the broadest level, computers are being used to keep track of all
participants in the system. At the other extreme, the power of the
computer is the essential ingredient in the remarkable development
called adaptive testing that permits individualization of the testing
process.

Another major theme is productivity. The key ingredient in a substantial
portion of current work under that theme is the management of
incentives. Good incentive management has been shown to raise
productivity while also upgrading morale.

Specific problems are numerous. For example, a major specific problem is
early attrition. Solutions are being sought through such techniques as
better communication with prospective recruits, better indoctrination
procedures, more and expanded options for career advancement for sailors
assigned to general duties.

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IV-A-7 : LISTING OF  NAVY IN MANPOWER AND PERSONNEL


               PERFORMING   FY84   FY85 CONG
PE/PROJECT     ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

61153N                                           DEFENSE RESEARCH SCIENCES

 RRO4204      ONR          0.879  0.886  MP   3      PERSONNEL UTILIZATION

 RRO4208      ONR          1.933  2.198  MP   2      ORGANIZATIONAL
                                                     EFFECTIVENESS
                          ------ ------
             TOTAL:        2.812  3.084 (MANPOWER AND PERSONNEL IN PE)


   TOTAL FUNDING IN PROGRAM ELEMENT 61153N :            FY84      FY85
                                                       ------    ------
                    THE PRESIDENT'S BUDGET, JANUARY 1984   9.916    12.531

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(CONTINUATION)

IV-A-7 : LISTING OF NAVY IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62763N						PERSONNEL AND TRAINING TECHNOLOGY
F63-521	NPRDC	4.033	4.649	MP	2	MANPOWER AND PERSONNEL TECHNOLOGY
		------	------			
	TOTAL:	4.033	4.649			(MANPOWER AND PERSONNEL IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62763N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	5.684	6.456

(CONTINUATION)

IV-A-7 : LISTING OF NAVY IN MANPOWER AND PERSONNEL
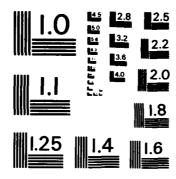
PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63707N						MANPOWER CONTROL SYSTEMS DEVELOPMENT
Z1770	NPRDC	1.805	5.074	MP	2	MANPOWER AND PERSONNEL DEVELOPMENT
	TOTAL:	1.805	5.074			(MANPOWER AND PERSONNEL IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63707N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.805	5.074

(CONTINUED)

MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

(CONTINUATION)

IV-A-7 : LISTING OF NAVY IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63732M						MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS
C0073	HQMC	1.701	1.689	MP	1A	HUMAN RESOURCES MANAGEMENT AND FORECASTING
	TOTAL:	1.701	1.689			(MANPOWER AND PERSONNEL IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63732M :		
THE PRESIDENT'S BUDGET, JANUARY 1984	2.109	3.018

(CONTINUATION)

IV-A-7 : LISTING OF NAVY IN MANPOWER AND PERSONNEL

```
              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=====================================================================

64703N                                            TRAINING AND PERSONNEL
                                                  SYSTEM DEVELOPMENT

Z1385         NTEC         0.462  0.000  MP   2D      COMPUTER ADAPTIVE TESTING
                           ------ ------
              TOTAL:       0.462  0.000 (MANPOWER AND PERSONNEL IN PE)


   TOTAL FUNDING IN PROGRAM ELEMENT 64703N :              FY84     FY85
                                                          ------   ------
              THE PRESIDENT'S BUDGET, JANUARY 1984        3.285    6.505
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CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: NAVY

CONTRIBUTING
PROGRAM ELEMENTS: 62757N HUMAN FACTORS AND SIMULATION
                                   TECHNOLOGY

                            63732M MARINE CORPS ADVANCED
                                   MANPOWER/TRAINING SYSTEMS

                            63733N TRAINING DEVICES TECHNOLOGY

                            64703N TRAINING AND PERSONNEL SYSTEM
                                   DEVELOPMENT

                            64714N AIR WARFARE TRAINING DEVICES

                            64715N SURFACE WARFARE TRAINING DEVICES

                            64716N SUBMARINE WARFARE TRAINING DEVICES

SYNOPSIS:

The goal of the work within this category is to bring the whole range of
available technologies to bear on the design, development, and
procurement of training devices that will impart high levels of skill at
the lowest possible price. The direction of the effort is to expand the
range of skilled activities that can be covered by simulation
techniques. Examples include firefighting and tactical air support of
ground forces.

Problem areas include training of crews in teamwork, training higher
level command personnel in new tactics and strategies associated with
new weapon capabilities, and working out the most economical balance
between the use of actual operational equipment for training and the use
of synthetic devices.

Many technologies are being explored; micro-computers being one that is
prominent. But in addition to new applications of computers, the
technologies include lasers, fiber optics, infra-red optics, video-disc
recording, and others.

The products of this effort are numerous but among the more recent and
most impressive are new means for simulating air-to-air combat and the
newly developed ability to provide exercises in the use of large caliber
advance in settings other than ranges--thus avoiding negative
environmental, economic, and political consequences.

Other products include voice-activated computer controls, safety
equipment for the crews of hydrofoil vessels, new methods of visual
scene simulation for operational flight trainers and improved exercise
plans for submarine attack training.

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IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62757N						HUMAN FACTORS AND SIMULATION TECHNOLOGY
F57-242	NTEC	0.000	0.222	ST	6	TACTICAL INFORMATION CORRELATION
F57-526	NTEC	3.679	3.615	ST	6	SIMULATION TECHNOLOGY
	TOTAL:	3.679	3.837			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62757N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	7.309	7.967

(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63732M						MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS
C0074	HQMC	0.114	0.338	ST	6G	TRAINING DEVICES AND SIMULATORS
	TOTAL:	0.114	0.338			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63732M :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.109	3.018

(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

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             PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
==================================================================================

63733N                                            TRAINING DEVICES TECHNOLOGY

 W1773       NTEC        6.555  7.785  ST    6    TRAINING DEVICES
                                                  TECHNOLOGY
                         ------ ------
             TOTAL:      6.555  7.785 (SIMULATION AND TRAINING DEVICES IN PE)

  TOTAL FUNDING IN PROGRAM ELEMENT 63733N :                FY84      FY85
                                                           ------    ------
               THE PRESIDENT'S BUDGET, JANUARY 1984        6.555     7.785
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(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64703N						TRAINING AND PERSONNEL SYSTEM DEVELOPMENT
X1328	NTEC	2.823	0.000	ST	6C	BATTLE GROUP TACTICAL TRAINER
Z1822	NAVSEA	0.000	1.179	ST	6G	MANPOWER AND HUMAN FACTORS ENGINEERING
Z1823	NTEC	0.000	5.326	ST	6	TRAINING AND TRAINING DEVICE SYSTEMS DEVELOPMENT
	TOTAL:	2.823	6.505			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 64703N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	3.285	6.505

(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64714N						AIR WARFARE TRAINING DEVICES
W1112	NAVAIR	11.585	3.125	ST	6	SH-60B TRAINERS
	TOTAL:	11.585	3.125			(SIMULATION AND TRAINING DEVICES IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64714N :		
THE PRESIDENT'S BUDGET, JANUARY 1984	11.585	3.125

(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715N						SURFACE WARFARE TRAINING DEVICES
Z1126	NTEC	0.941	0.000	ST	6	SURFACE TOMAHAWK TRAINER
Z1127	NTEC	0.469	0.400	ST	6	FFG-7 PIERSIDE COMBAT SYSTEM TEAM TRAINER
Z1130	NTEC	0.196	0.000	ST	6	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY
Z1131	NTEC	0.821	0.000	ST	6	DEVICE 14E19/14E25/14E25A MODIFICATIONS
Z1132	NTEC	6.243	4.774	ST	6	LAMPS MK III/SQQ-89 TRAINING SYSTEMS
Z1134	NTEC	0.281	0.000	ST	6	OUTBOARD OPERATOR/TEAM TRAINER
Z1140	NTEC	0.372	1.998	ST	6	TACTICAL ADVANCED COMBAT DIRECTION ELECTRONIC WARFARE (TACDEW) MODIFICATIONS
Z1268	NTEC	1.658	0.000	ST	6	AN/SQR-18A SONAR OPERATOR/TEAM TRAINER
Z1270	NTEC	5.712	5.872	ST	6	UNIVERSAL/SQQ-89 SONAR MAINTENANCE TRAINER
Z1274	NTEC	2.932	4.935	ST	6	AIR INTERCEPT/ANTI-SUBMARINE AIR CONTROLLER TRAINER
Z1427	NTEC	3.044	5.927	ST	6	SURFACE TACTICAL TRAINERS
Z1434	NTEC	0.955	0.357	ST	6	SHIPBOARD "ORGANIC" COMBAT SYSTEM TEAM TRAINER (SOCSTT)

(CONTINUED)

(CONTINUATION WITHIN PE 64715N)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
Z1435	NTEC	0.135	0.000	ST	6	SHIPHANDLING TRAINING SYSTEM
Z1436	NTEC	0.759	0.775	ST	6	SURFACE WARFARE TRAINING ANALYSIS
Z1605	NTEC	2.541	4.635	ST	6C	TERRIER NEW THREAT UPGRADE TEAM TRAINER
Z1834	NTEC	0.000	2.500	ST	6	LANDING CRAFT AIR CUSHION OPERATOR TRAINER
TOTAL:		27.069	32.173			(SIMULATION AND TRAINING DEVICES IN PE)

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64715N :			
THE PRESIDENT'S BUDGET, JANUARY 1984		27.069	32.173

(CONTINUED)

(CONTINUATION)

IV-A-8 : LISTING OF NAVY IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64716N						SUBMARINE WARFARE TRAINING DEVICES
S1735	NTEC	0.577	0.486	ST	6	GAS MANAGEMENT SYSTEM TRAINER
	TOTAL:	0.577	0.486			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 64716N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	0.577	0.486

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: EDUCATION & TRAINING

DoD ORGANIZATION: AIR FORCE

CONTRIBUTING
PROGRAM ELEMENTS: 61102F DEFENSE RESEARCH SCIENCES

                            62205F TRAINING AND SIMULATION TECHNOLOGY

                            63704F MANPOWER AND PERSONNEL SYSTEMS
                                   TECHNOLOGY

SYNOPSIS:

Two functional areas are targeted by work within this category: command
and control maintenance. In both areas several approaches are being
used. One prominent consideration is the capability of the computer to
support the provision of instructional information to students and to
aid in the planning and management of instruction.

The high cost of training is a crucial factor, and work is going forward
to establish the best balance between formal classroom instruction and
on-the-job training. The computer should be helpful in these
developments by providing a tool for facilitating the decentralization
of the instructional process and the re-assignment of more training
responsibility to the student in the form of self-instructional
programs. The micro-computer appears to be one major ingredient in such
developments.

Recent achievements within this category include the promulgation of new
guidelines for the procurement of job guides for maintenance training
and maintenance operations and the production of a course in R&D
management that is self-instructional in nature.

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IV-A-8 : LISTING OF  AF IN EDUCATION AND TRAINING


              PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
========================================================================

61102F                                         DEFENSE RESEARCH SCIENCES

  2313-T1    AFHRL       0.550  0.550  ET   6      MANPOWER MANAGEMENT
                        ------ ------
             TOTAL:      0.550  0.550 (EDUCATION AND TRAINING IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 61102F :              FY84    FY85
                                                        ------  ------
                  THE PRESIDENT'S BUDGET, JANUARY 1984   5.524   5.681

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(CONTINUATION)

IV-A-9 : LISTING OF AF IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
05HT-1	AFHRL	1.615	1.642	ET	V A R	LABORATORY SUPPORT
1121	AFHRL	2.250	1.800	ET	6	TECHNICAL TRAINING DEVELOPMENT
1123	AFHRL	2.745	2.800	ET	6	FLYING TRAINING DEVELOPMENT
3017	AFHRL	0.000	0.617	ET	6	COMMAND AND CONTROL TRAINING
	TOTAL:	6.610	6.859			(EDUCATION AND TRAINING IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62205F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

(CONTINUATION)

IV-A-9 : LISTING OF AF IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
83704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2949	AFHRL	0.000	0.360	ET	6	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM
2951	AFHRL	0.130	0.350	ET	6	TRAINING DECISIONS SYSTEM
	TOTAL:	0.130	0.710			(EDUCATION AND TRAINING IN PE)

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 83704F :			
THE PRESIDENT'S BUDGET, JANUARY 1984		0.800	2.043

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: HUMAN FACTORS

DoD ORGANIZATION: AIR FORCE

CONTRIBUTING
PROGRAM ELEMENTS: 61102F DEFENSE RESEARCH SCIENCES

                     62202F AEROSPACE BIOTECHNOLOGY

                     62205F TRAINING AND SIMULATION TECHNOLOGY

                     63231F CREW SYSTEMS TECHNOLOGY

                     63365F SPACE BIOTECHNOLOGY

                     63751F INNOVATIONS IN EDUCATION AND
                            TRAINING

SYNOPSIS:

The overall goal of the Air Force work within this R&D category is the
support of the planning, design, and procurement of new aerospace
systems. The main criteria for system design advanced by work within
this category are operability and maintainability, but concern is also
focused on survivability in hostile combat environments.

The basic assumption is that systems can be designed to be compatible
with human capabilities and limitations.

Immediate objectives include the development of new planning procedures
that will help ensure that high quality human factors participation
occurs early and throughout the system development process. Another
prime objective is the improvement of the match between human and computer;
particularly for command and control functions. A related thrust is the
development of computer-based aids for the maintenance function.

Recent achievements within this category in direct support of combat
efficiency have been the development of helmet mounted weapon sights for
air-to-air and air-to-ground targets and the development of methods for
countering hostile anti-aircraft defenses using high intensity light
generation.

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IV-A-10 : LISTING OF AF IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102F						DEFENSE RESEARCH SCIENCES
2313-A4	AFOSR	1.187	1.225	HF	4	HUMAN FACTORS ENGINEERING
2313-V1	AFAMRL	.0.225	0.225	HF	4	FUNDAMENTALS FOR MAN-MACHINE INTEGRATION
	TOTAL:	1.412	1.450			(HUMAN FACTORS IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 61102F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.524	5.681

(CONTINUATION)

IV-A-10 : LISTING OF AF IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62202F						AEROSPACE BIOTECHNOLOGY
06MD	AMD	8.800	9.500	HF	V A R	AEROSPACE MEDICAL DIVISION LABORATORY OPERATIONS
6893	AMD	1.550	1.750	HF	4B	MANNED WEAPON SYSTEMS EFFECTIVENESS
7184	AMD	4.200	4.600	HF	4	MAN-MACHINE INTEGRATION TECHNOLOGY
	TOTAL:	14.550	15.850	(HUMAN FACTORS IN PE)		

TOTAL FUNDING IN PROGRAM ELEMENT 62202F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	14.550	15.850

(CONTINUED)

(CONTINUATION)

IV-A-10 : LISTING OF AF IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
1710	AFHRL	4.124	4.300	HF	4	LOGISTICS AND MAINTENANCE TECHNOLOGY
		------	------			
	TOTAL:	4.124	4.300			(HUMAN FACTORS IN PE)

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62205F :		------	------
THE PRESIDENT'S BUDGET, JANUARY 1984		22.477	23.285

(CONTINUATION)

IV-A-10 : LISTING OF AF IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63231F						CREW SYSTEMS TECHNOLOGY
2829	AMD	1.300	3.957	HF	4	COCKPIT AUTOMATION TECHNOLOGY (CAT)
	TOTAL:	1.300	3.957			(HUMAN FACTORS IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63231F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.300	3.957

(CONTINUATION)

IV-A-10 : LISTING OF AF IN HUMAN FACTORS

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            PERFORMING  FY84   FY85 CONG
PE/PROJECT  ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■


83385F                                          SPACE BIOTECHNOLOGY

  2992      AMD         0.000  0.701  HF  4      SPACE BIOTECHNOLOGY
                        ------ ------
          TOTAL:        0.000  0.701 (HUMAN FACTORS IN PE)


  TOTAL FUNDING IN PROGRAM ELEMENT 83385F :          FY84    FY85
                                                    ------  ------
            THE PRESIDENT'S BUDGET, JANUARY 1984    0.000   0.701

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(CONTINUATION)

IV-A-10 : LISTING OF AF IN HUMAN FACTORS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2362	AFHRL	0.700	0.700	HF	6	COMPUTER-BASED MAINTENANCE AIDS
2744	AFHRL	1.225	1.500	HF	4	UNIFIED DATA BASE APPLICATION
2745	AFHRL	0.000	0.981	HF	5	LOGISTICS FOR COMBAT READINESS MAINTENANCE
	TOTAL:	1.925	3.181	(HUMAN FACTORS IN PE)		

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63751F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: MANPOWER & PERSONNEL

DoD ORGANIZATION: AIR FORCE

CONTRIBUTING
PROGRAM ELEMENTS: 62703F PERSONNEL UTILIZATION TECHNOLOGY

                            63704F MANPOWER AND PERSONNEL SYSTEMS
                                   TECHNOLOGY

SYNOPSIS:

The Air Force has two major areas of responsibility under the manpower
and personnel category: the development of aids to total personnel
system administration, and the accurate measurement of productivity. In
the former area, the principal work orientation is toward the
exploitation of computer capabilities--particularly in application of
computer-based models of the "pipeline" processes from recruitment
through selection, training, assignment, and career management. However,
a principal focus is on the analysis of the basic manpower supply
factor. This work has resulted in the successful development of a
National Skills Market Model that supports the selection of economical
models of recruitment.

In the area of productivity assessment, work is being pursued in both
operational and support functions but the crucial enterprise for the Air
Force has been the successful implementation of new techniques for
performance measurement in the area of the civilian workforce. This
accomplishment is conducive to the fulfillment of the assignment given
the Air Force to lead in the management of the provision of the Civil
Service Reform Act of 1978.

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IV-A-11 : LISTING OF AF IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62703F						PERSONNEL UTILIZATION TECHNOLOGY
06HP	AFHRL	3.999	4.042	MP	V A R	LABORATORY SUPPORT
7719	AFHRL	2.366	3.565	MP	2	FORCE ACQUISITION AND DISTRIBUTION SYSTEM
7734	AFHRL	0.635	1.150	MP	1	FORCE MANAGEMENT SYSTEM
	TOTAL:	7.000	8.757	(MANPOWER AND PERSONNEL IN PE)		

TOTAL FUNDING IN PROGRAM ELEMENT 62703F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	7.000	8.757

(CONTINUATION)

IV-A-11 : LISTING OF AF IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2922	AFHRL	0.500	1.242	MP	2	PERSONNEL ASSESSMENT SYSTEMS
2948	AFHRL	0.170	0.091	MP	3	COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAM (CODAP)
	TOTAL:	0.670	1.333			(MANPOWER AND PERSONNEL IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63704F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	0.800	2.043

CONGRESSIONAL CATEGORY SYNOPSIS

CONGRESSIONAL CATEGORY: SIMULATION & TRAINING DEVICES

DoD ORGANIZATION: AIR FORCE

CONTRIBUTING
PROGRAM ELEMENTS: 61102F DEFENSE RESEARCH SCIENCES

                            62205F TRAINING AND SIMULATION TECHNOLOGY

                            63227F ADVANCED SIMULATOR TECHNOLOGY

                            63751F INNOVATIONS IN EDUCATION AND
                                   TRAINING

                            64227F FLIGHT SIMULATOR DEVELOPMENT

SYNOPSIS:

A main line of work that traverses the category from the 6.2 to the 6.4
levels is better visual simulation. This work encompasses the
exploration of new technologies such as computer image generation,
holography, fiber optics, and infra-red systems. Objectives include
better image definition, better color representation, better image
dynamics (e.g., moving targets in 3-D), wider fields of view, and the
accurate representation of special sensors.

While much of the focus is on pilot training--particularly in training
and retraining of combat skills--more attention is being given to
command and control and maintenance functions. In the latter area, the
issue of cost trade-offs between simulation training and lower fidelity
training approaches is receiving particular attention.

Recent achievements within this category include the development of a
new trainer for teaching B-52 crews low altitude attack skills and a
trainer for B-52 mid-air refueling.

Other successes include the formulation of a sensory perception model
for trainer design that has led to cost avoidance in the procurement of
motion simulation equipment.

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IV-A-12 : LISTING OF AF IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102F						DEFENSE RESEARCH SCIENCES
2313-A5	AFOSR	2.857	2.976	ST	6	VISUAL INFORMATION PROCESSING
2313-T3	AFHRL	0.280	0.280	ST	6	FLYING TRAINING RESEARCH
2313-V2	AFAMRL	0.425	0.425	ST	6	BASIC VISION RESEARCH
	TOTAL:	3.562	3.681			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 61102F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.524	5.681

(CONTINUATION)

IV-A-12 : LISTING OF AF IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
06HT-2	AFHRL	4.843	4.926	ST	V A R	LABORATORY SUPPORT
1192	AFHRL	5.200	5.400	ST	6	ADVANCED SIMULATION FOR PILOT TRAINING
8114	AFHRL	1.700	1.800	ST	6	FLIGHT SIMULATOR TECHNOLOGY
	TOTAL:	11.743	12.126			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 62205F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

(CONTINUATION)

IV-A-12 : LISTING OF AF IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63227F						ADVANCED SIMULATOR TECHNOLOGY
2363	AFHRL	6.635	5.960	ST	6	ADVANCED VISUAL TECHNOLOGY SYSTEM
2743	AFHRL	0.096	0.441	ST	6	ADVANCED SIMULATOR CONCEPTS
	TOTAL:	6.731	6.401			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63227F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	6.731	6.401

(CONTINUATION)

IV-A-12 : LISTING OF AF IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2359	AFHRL	0.868	0.040	ST	3	PILOT PERFORMANCE MEASUREMENT
2361	AFHRL	0.500	0.000	ST	6	MAINTENANCE TRAINING SIMULATION
2557	AFHRL	1.207	1.860	ST	6	INTEGRATED TRAINING MANAGEMENT SYSTEM (ITS)
	TOTAL:	2.575	1.900			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 63751F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

(CONTINUATION)

IV-A-12 : LISTING OF AF IN SIMULATION AND TRAINING DEVICES

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64227F						FLIGHT SIMULATOR DEVELOPMENT
2325	SIMSPO	3.650	3.620	ST	6D	SIMULATOR DEVELOPMENT ACTIVITIES
2769	SIMSPO	5.615	27.706	ST	6G	SIMULATOR UPDATE DEVELOPMENT
2851	SIMSPO	0.957	1.430	ST	6G	STANDARD DMA DATA BASE TRANSFORMATION PROGRAM
2901	SIMSPO	9.669	51.002	ST	6	B-1B WEAPON SYSTEM TRAINER (WST)
2902	SIMSPO	0.200	8.186	ST	6	T-46 OPERATIONAL FLIGHT TRAINER (OFT)
2903	SIMSPO	3.150	1.960	ST	6	F-15/F-16 SIMULATOR FOR AIR-TO-AIR COMBAT (SAAC)
	TOTAL:	23.241	93.904			(SIMULATION AND TRAINING DEVICES IN PE)

TOTAL FUNDING IN PROGRAM ELEMENT 64227F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	23.241	93.904

IV.B. MANPOWER, PERSONNEL AND TRAINING PROGRAM
GOAL LISTINGS

GOAL LISTINGS
(continued)

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IV-B-1 : LISTING OF  NAVY IN GOAL 1 -- MANAGEMENT TRADE-OFFS


              PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.   ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=======================================================================

63732M                                       MARINE CORPS ADVANCED
                                             MANPOWER/TRAINING SYSTEMS

 C0073      HQMC      1.701  1.689  MP   1A   HUMAN RESOURCES
                                             MANAGEMENT AND FORECASTING
                      ------ ------
                      1.701  1.689   TOTAL GOAL 1 IN PE

   TOTAL FUNDING IN PROGRAM ELEMENT 63732M :          FY84      FY85
                                                     ------    ------
                  THE PRESIDENT'S BUDGET, JANUARY 1984 2.109    3.018

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(CONTINUATION)

IV-B-1 : LISTING OF AF IN GOAL 1 -- MANAGEMENT TRADE-OFFS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62703F						PERSONNEL UTILIZATION TECHNOLOGY
7734	AFHRL	0.635	1.150	MP	1	FORCE MANAGEMENT SYSTEM
		0.635	1.150			TOTAL GOAL 1 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62703F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	7.000	8.757

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IV-B-2 : LISTING OF  ARMY IN GOAL 2 -- ACCESSION AND RETENTION


              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■


61102A                                            DEFENSE RESEARCH SCIENCES

  B74F-3     ARI      0.756  1.000   MP   2        PERSONNEL PERFORMANCE AND
                                                   TRAINING
                      ------ ------
                      0.756  1.000        TOTAL GOAL 2 IN PE


  TOTAL FUNDING IN PROGRAM ELEMENT 61102A :                 FY84      FY85
                                                            ------    ------
                    THE PRESIDENT'S BUDGET, JANUARY 1984    5.198     7.208

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(CONTINUATION)

IV-B-2 : LISTING OF ARMY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62722A						MANPOWER, PERSONNEL AND TRAINING
A791-1	ARI	2.950	3.561	MP	2	MANPOWER, PERSONNEL AND TRAINING
		------	------			
		2.950	3.561			TOTAL GOAL 2 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62722A :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	6.556	7.913

(CONTINUED)

(CONTINUATION)

IV-B-2 : LISTING OF ARMY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63731A						MANPOWER AND PERSONNEL
A792-1	ARI	9.825	17.026	MP	2	MANPOWER AND PERSONNEL
		9.825	17.026			TOTAL GOAL 2 IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63731A :			
THE PRESIDENT'S BUDGET, JANUARY 1984		9.825	17.026

(CONTINUATION)

IV-B-2 : LISTING OF NAVY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61153N						DEFENSE RESEARCH SCIENCES
RR04208	ONR	1.933	2.198	MP	2	ORGANIZATIONAL EFFECTIVENESS
		------	------			
		1.933	2.198			TOTAL GOAL 2 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 61153N :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	9.916	12.531

(CONTINUATION)

IV-B-2 : LISTING OF NAVY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62763N						PERSONNEL AND TRAINING TECHNOLOGY
F63-521	NPRDC	4.033	4.649	MP	2	MANPOWER AND PERSONNEL TECHNOLOGY
F63-528	NPRDC	0.190	0.000	HF	2B	PERSONNEL PERFORMANCE ASSESSMENT AND ENHANCEMENT
		4.223	4.649			TOTAL GOAL 2 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62763N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.684	6.456

(CONTINUATION)

IV-B-2 : LISTING OF NAVY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63707N						MANPOWER CONTROL SYSTEMS DEVELOPMENT
Z1770	NPRDC	1.805	5.074	MP	2	MANPOWER AND PERSONNEL DEVELOPMENT
		1.805	5.074			TOTAL GOAL 2 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63707N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.805	5.074

(CONTINUATION)

IV-B-2 : LISTING OF NAVY IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64703N						TRAINING AND PERSONNEL SYSTEM DEVELOPMENT
Z1385	NTEC	0.462	0.000	MP	2D	COMPUTER ADAPTIVE TESTING
		0.462	0.000			TOTAL GOAL 2 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64703N :		
THE PRESIDENT'S BUDGET, JANUARY 1984	3.285	6.505

(CONTINUATION)

IV-B-2 : LISTING OF AF IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62703F						PERSONNEL UTILIZATION TECHNOLOGY
7719	AFHRL	2.366	3.565	MP	2	FORCE ACQUISITION AND DISTRIBUTION SYSTEM
		2.366	3.565			TOTAL GOAL 2 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62703F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	7.000	8.757

(CONTINUATION)

IV-B-2 : LISTING OF AF IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2922	AFHRL	0.500	1.242	MP	2	PERSONNEL ASSESSMENT SYSTEMS
		0.500	1.242			TOTAL GOAL 2 IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63704F :			
THE PRESIDENT'S BUDGET, JANUARY 1984		0.800	2.043

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IV-B-3 : LISTING OF  NAVY IN GOAL 3 -- UNIT PRODUCTIVITY


           PERFORMING   FY84   FY85 CONG
PE/PROJECT ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================


61153N                                       DEFENSE RESEARCH SCIENCES

  RRO4204   ONR       0.879 0.886   MP  3      PERSONNEL UTILIZATION
                      ------ ------
                      0.879 0.886   TOTAL GOAL 3 IN PE


  TOTAL FUNDING IN PROGRAM ELEMENT 61153N :              FY84    FY85
                                                        ------  ------
            THE PRESIDENT'S BUDGET, JANUARY 1984        9.916   12.531

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(CONTINUATION)

IV-B-3 : LISTING OF AF IN GOAL 3 -- UNIT PRODUCTIVITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2948	AFHRL	0.170	0.091	MP	3	COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAM (CODAP)
		0.170	0.091			TOTAL GOAL 3 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63704F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	0.800	2.043

(CONTINUATION)

IV-B-3 : LISTING OF AF IN GOAL 3 -- UNIT PRODUCTIVITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2359	AFHRL	0.868	0.040	ST	3	PILOT PERFORMANCE MEASUREMENT
		------	------			
		0.868	0.040		TOTAL GOAL 3 IN PE	

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63751F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

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IV-B-4 : LISTING OF ARMY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS


              PERFORMING  FY84   FY85 CONG
PE/PROJECT   ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=====================================================================================

61102A                                          DEFENSE RESEARCH SCIENCES

 B74A        HEL        2.457  2.617  HF   4       HUMAN ENGINEERING

 B74F-2      ARI        0.751  1.591  HF   4       PERSONNEL PERFORMANCE AND
                                                   TRAINING

 B74F-4      ARI        0.352  0.500  ST   4       PERSONNEL PERFORMANCE AND
                                                   TRAINING
                        ------ ------
                        3.560  4.708  TOTAL GOAL 4 IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 61102A :              FY84    FY85
                                                          ------  ------
                  THE PRESIDENT'S BUDGET, JANUARY 1984   5.198   7.208

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(CONTINUATION)

IV-B-4 : LISTING OF ARMY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

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               PERFORMING   FY84  FY85 CONG
PE/PROJECT  ORGANIZ.   ($M)  ($M) CAT  GOAL  PE/PROJECT TITLES
======================================================================

62716A                                        HUMAN FACTORS ENGINEERING
                                              SYSTEM DEVELOPMENT

  AH70       HEL        9.825 11.468  HF   4   HUMAN FACTORS ENGINEERING
                                              SYSTEM DEVELOPMENT
                        ------ ------
                        9.825 11.468    TOTAL GOAL 4 IN PE
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   TOTAL FUNDING IN PROGRAM ELEMENT 62716A :   FY84   FY85
                                                     ------   ------
                 THE PRESIDENT'S BUDGET, JANUARY 1984 9.825   11.468

(CONTINUATION)

IV-B-4 : LISTING OF ARMY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62717A						HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
A790-1	ARI	1.551	1.910	HF	4	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
		1.551	1.910			TOTAL GOAL 4 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62717A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	3.877	4.776

(CONTINUATION)

IV-B-4 : LISTING OF ARMY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63739A						HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
A793	ARI	4.202	10.376	HF	4	HUMAN FACTORS IN TRAINING AND OPERATIONAL EFFECTIVENESS
		4.202	10.376			TOTAL GOAL 4 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63739A :		FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984		4.202	10.376

(CONTINUED)

(CONTINUATION)

IV-B-4 : LISTING OF NAVY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

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             PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
===================================================================================

61153N                                          DEFENSE RESEARCH SCIENCES

  RRO4209    ONR        2.467  2.815   HF   4       ENGINEERING PSYCHOLOGY

  WRO4210    NAVAIR     0.320  0.340   HF   4       HUMAN FACTORS ENGINEERING
                        ------ ------
                        2.787  3.155       TOTAL GOAL 4 IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 61153N :              FY84     FY85
                                                         ------   ------
                      THE PRESIDENT'S BUDGET, JANUARY 1984  9.916   12.531
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(CONTINUATION)

IV-B-4 : LISTING OF NAVY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62757N						HUMAN FACTORS AND SIMULATION TECHNOLOGY
F57-525	NADC	3.265	3.725	HF	4	HUMAN FACTORS TECHNOLOGY
F57-701	ONR	0.365	0.405	HF	4B	SMALL BUSINESS
		3.630	4.130			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62757N :		
THE PRESIDENT'S BUDGET, JANUARY 1984	7.309	7.967

(CONTINUATION)

IV-B-4 : LISTING OF NAVY IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63701N						HUMAN FACTORS ENGINEERING
W0542	NADC	0.641	0.676	HF	4A	AIR HUMAN FACTORS ENGINEERING TECHNOLOGY
Z1771	NPRDC	0.551	1.186	HF	4	GENERAL HUMAN FACTORS ENGINEERING
		1.192	1.862			TOTAL GOAL 4 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63701N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	1.192	1.862

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102F						DEFENSE RESEARCH SCIENCES
2313-A4	AFOSR	1.187	1.225	HF	4	HUMAN FACTORS ENGINEERING
2313-V1	AFAMRL	0.225	0.225	HF	4	FUNDAMENTALS FOR MAN-MACHINE INTEGRATION
		------	------			
		1.412	1.450			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 61102F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	5.524	5.681

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62202F						AEROSPACE BIOTECHNOLOGY
6893	AMD	1.550	1.750	HF	4B	MANNED WEAPON SYSTEMS EFFECTIVENESS
7184	AMD	4.200	4.600	HF	4	MAN-MACHINE INTEGRATION TECHNOLOGY
		------	------			
		5.750	6.350			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62202F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	14.550	15.850

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
1710	AFHRL	4.124	4.300	HF	4	LOGISTICS AND MAINTENANCE TECHNOLOGY
		------	------			
		4.124	4.300			TOTAL GOAL 4 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62205F :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63231F						CREW SYSTEMS TECHNOLOGY
2829	AMD	1.300	3.957	HF	4	COCKPIT AUTOMATION TECHNOLOGY (CAT)
		------	------			
		1.300	3.957			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63231F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	1.300	3.957

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63365F						SPACE BIOTECHNOLOGY
2992	AMD	0.000	0.701	HF	4	SPACE BIOTECHNOLOGY
		0.000	0.701			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63365F :		
THE PRESIDENT'S BUDGET, JANUARY 1984	0.000	0.701

(CONTINUATION)

IV-B-4 : LISTING OF AF IN GOAL 4 -- DESIGNING FOR SYSTEM READINESS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2744	AFHRL	1.225	1.500	HF	4	UNIFIED DATA BASE APPLICATION
		------	------			
		1.225	1.500			TOTAL GOAL 4 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63751F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

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IV-B-5 : LISTING OF NAVY IN GOAL 5 -- IMPROVED SUSTAINABILITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63727N						ADVANCED TECHNOLOGY FOR LOGISTICS INFORMATION
T1805	NSRDC	0.000	5.023	ET	5	NAVY AUTOMATED PUBLISHING SYSTEM
T1806	NSRDC	0.000	2.171	ET	5B	LOGISTICS SYSTEMS INFORMATION NETWORK
W1032	NSRDC	1.697	3.339	ET	5D	NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM
		------	------			
		1.697	10.533			TOTAL GOAL 5 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63727N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	1.697	10.533

(CONTINUATION)

IV-B-5 : LISTING OF AF IN GOAL 5 -- IMPROVED SUSTAINABILITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2745	AFHRL	0.000	0.981	HF	5	LOGISTICS FOR COMBAT READINESS MAINTENANCE
		------	------			
		0.000	0.981			TOTAL GOAL 5 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63751F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

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IV-B-6 : LISTING OF  ARMY IN GOAL 6 -- TRAINING SYSTEMS


            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================


61102A                                          DEFENSE RESEARCH SCIENCES

 B74F-1     ARI       0.882  1.500   ET  6      PERSONNEL PERFORMANCE AND
                      ------ ------                TRAINING
                      0.882  1.500       TOTAL GOAL 6 IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 61102A :              FY84      FY85
                                                          ------    ------
                 THE PRESIDENT'S BUDGET, JANUARY 1984     5.198     7.208

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(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62717A						HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
A790-2	ARI	2.326	2.866	ST	6	HUMAN PERFORMANCE EFFECTIVENESS AND SIMULATION
		2.326	2.866			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62717A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	3.877	4.776

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

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              PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

62722A                                        MANPOWER, PERSONNEL AND
                                              TRAINING

 A791-2     ARI         3.606  4.352  ET  6    MANPOWER, PERSONNEL AND
                                              TRAINING
                        ------ ------
                        3.606  4.352   TOTAL GOAL 6 IN PE


  TOTAL FUNDING IN PROGRAM ELEMENT 62722A :              FY84    FY85
                                                        ------  ------
              THE PRESIDENT'S BUDGET, JANUARY 1984  6.556   7.913
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(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

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              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

62727A                                           NON-SYSTEM TRAINING
                                                 DEVICES (NSTD) TECHNOLOGY

 A230         PMTRADE     3.365  4.528   ST  6    NON-SYSTEM TRAINING
                         ------- ------             DEVICES (NSTD) TECHNOLOGY
                         3.365  4.528    TOTAL GOAL 6 IN PE


  TOTAL FUNDING IN PROGRAM ELEMENT 62727A :            FY84     FY85
                                                      ------   ------
                 THE PRESIDENT'S BUDGET, JANUARY 1984 3.365    4.528

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(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63216A						SYNTHETIC FLIGHT SIMULATORS
DB34	AVRADCOM	5.125	3.285	ST	6	ROTOR SYSTEM INTEGRATION SIMULATOR (RSIS)
DB39	PMTRADE	6.976	5.808	ST	6G	FLIGHT SIMULATOR COMPONENTS
		------	------			
		12.101	9.093	TOTAL GOAL 6 IN PE		

TOTAL FUNDING IN PROGRAM ELEMENT 63216A :   FY84   FY85
                                                       ------   ------
              THE PRESIDENT'S BUDGET, JANUARY 1984 12.101   9.093

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63738A						NON-SYSTEM TRAINING DEVICES (NSTD) DEVELOPMENT
A224	PMTRADE	2.365	2.462	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARMOR/ANTI-ARMOR
A225	PMTRADE	0.000	3.638	ST	6	NON-SYSTEM TRAINING DEVICES (NSTD) ARTILLERY/AIR DEFENSE ENGINEER
		2.365	6.100			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63738A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.365	6.100

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63743A						EDUCATION AND TRAINING
A794-1	ARI	7.575	11.661	ET	6	EDUCATION AND TRAINING
		7.575	11.661			TOTAL GOAL 6 IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63743A :			
THE PRESIDENT'S BUDGET, JANUARY 1984		7.575	11.661

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

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            PERFORMING  FY84  FY85 CONG
PE/PROJECT  ORGANIZ.    ($M)  ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

63744A                                        TRAINING SIMULATION

 A795       ARI         3.034 4.763  ST  6       TRAINING SIMULATION
                        ------ ------
                        3.034 4.763  TOTAL GOAL 6 IN PE
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                                                      FY84    FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63744A :            ------  ------
             THE PRESIDENT'S BUDGET, JANUARY 1984    3.034   4.763
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(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64217A						SYNTHETIC FLIGHT TRAINING SYSTEMS
D275	PMTRADE	12.719	14.134	ST	6	SYNTHETIC FLIGHT TRAINING SYSTEMS
		12.719	14.134			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64217A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	12.719	14.134

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715A						NON-SYSTEM TRAINING DEVICES (NSTD) ENGINEERING
D237	PMTRADE	1.093	14.632	ST	6C	NON-SYSTEM TRAINING DEVICES - ARTILLERY/AIR DEFENSE/ENGINEER
D239	PMTRADE	0.000	0.985	ST	6C	NON-SYSTEM TRAINING DEVICES - INFANTRY
D241	PMTRADE	5.041	11.421	ST	6	NON-SYSTEM TRAINING DEVICES - COMBINED ARMS
D572	PMTRADE	2.840	1.477	ST	6	NON-SYSTEM TRAINING DEVICES - ARMOR/ANTI-ARMOR
D573	PMTRADE	3.571	6.015	ST	6B	PMTRADE AND NTEC SUPPORT
		12.545	34.530			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64715A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	12.545	34.530

(CONTINUATION)

IV-B-6 : LISTING OF ARMY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64722A						EDUCATION AND TRAINING SYSTEMS
D750	ARI	6.000	7.740	ET	6	EDUCATION AND TRAINING SYSTEM
		6.000	7.740			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64722A :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	6.000	7.740

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(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61153N						DEFENSE RESEARCH SCIENCES
RR04206	ONR	4.317	6.292	ET	6	LEARNING AND TRAINING
		4.317	6.292			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 61153N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	9.916	12.531

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62757N						HUMAN FACTORS AND SIMULATION TECHNOLOGY
F57-242	NTEC	0.000	0.222	ST	6	TACTICAL INFORMATION CORRELATION
F57-526	NTEC	3.679	3.615	ST	6	SIMULATION TECHNOLOGY
		3.679	3.837			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62757N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	7.309	7.967

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62763N						PERSONNEL AND TRAINING TECHNOLOGY
F63-522	NPRDC	1.461	1.807	ET	6F	COMPUTER-AIDED EDUCATION AND CLASSROOM TRAINING
		1.461	1.807			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62763N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.684	6.456

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63720N						EDUCATION AND TRAINING
Z1772	NPRDC	2.239	5.062	ET	6	EDUCATION AND TRAINING DEVELOPMENT
		------	------			
		2.239	5.062			TOTAL GOAL 6 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63720N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	2.239	5.062

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63732M						MARINE CORPS ADVANCED MANPOWER/TRAINING SYSTEMS
C0074	HQMC	0.114	0.338	ST	6G	TRAINING DEVICES AND SIMULATORS
C0867	HQMC	0.196	0.908	ET	6F	MARINE CORPS TRAINING RESOURCES DEVELOPMENT AND ANALYSIS
C1732	HQMC	0.098	0.083	ET	6F	USMC PROFESSIONAL MILITARY EDUCATION
		0.408	1.329			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63732M :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.109	3.018

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(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63733N						TRAINING DEVICES TECHNOLOGY
W1773	NTEC	6.555	7.785	ST	6	TRAINING DEVICES TECHNOLOGY
		------	------			
		6.555	7.785			TOTAL GOAL 6 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63733N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	6.555	7.785

(CONTINUATION)

IV-8-8 : LISTING OF NAVY IN GOAL 8 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64703N						TRAINING AND PERSONNEL SYSTEM DEVELOPMENT
X1328	NTEC	2.823	0.000	ST	8C	BATTLE GROUP TACTICAL TRAINER
Z1822	NAVSEA	0.000	1.179	ST	8G	MANPOWER AND HUMAN FACTORS ENGINEERING
Z1823	NTEC	0.000	5.328	ST	8	TRAINING AND TRAINING DEVICE SYSTEMS DEVELOPMENT
		2.823	6.505			TOTAL GOAL 8 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64703N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	3.285	6.505

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

```
              PERFORMING   FY84   FY85 CONG
PE/PROJECT    ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
=================================================================================

64714N                                           AIR WARFARE TRAINING
                                                 DEVICES

  W1112       NAVAIR      11.585  3.125  ST  6    SH-60B TRAINERS
                         ------- ------
                         11.585  3.125   TOTAL GOAL 6 IN PE
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  TOTAL FUNDING IN PROGRAM ELEMENT 64714N :              FY84    FY85
                                                        ------  ------
               THE PRESIDENT'S BUDGET, JANUARY 1984     11.585   3.125
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(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64715N						SURFACE WARFARE TRAINING DEVICES
Z1126	NTEC	0.941	0.000	ST	6	SURFACE TOMAHAWK TRAINER
Z1127	NTEC	0.469	0.400	ST	6	FFG-7 PIERSIDE COMBAT SYSTEM TEAM TRAINER
Z1130	NTEC	0.196	0.000	ST	6	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY
Z1131	NTEC	0.821	0.000	ST	6	DEVICE 14E19/14E25/14E25A MODIFICATIONS
Z1132	NTEC	6.243	4.774	ST	6	LAMPS MK III/SQQ-89 TRAINING SYSTEMS
Z1134	NTEC	0.291	0.000	ST	6	OUTBOARD OPERATOR/TEAM TRAINER
Z1140	NTEC	0.372	1.998	ST	6	TACTICAL ADVANCED COMBAT DIRECTION ELECTRONIC WARFARE (TACDEW) MODIFICATIONS
Z1268	NTEC	1.658	0.000	ST	6	AN/SQR-18A SONAR OPERATOR/TEAM TRAINER
Z1270	NTEC	5.712	5.872	ST	6	UNIVERSAL/SQQ-89 SONAR MAINTENANCE TRAINER
Z1274	NTEC	2.932	4.935	ST	6	AIR INTERCEPT/ANTI-SUBMARINE AIR CONTROLLER TRAINER
Z1427	NTEC	3.044	5.927	ST	6	SURFACE TACTICAL TRAINERS
Z1434	NTEC	0.955	0.357	ST	6	SHIPBOARD "ORGANIC" COMBAT SYSTEM TEAM TRAINER (SOCSTT)

(CONTINUATION WITHIN PE 64715N)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
Z1435	NTEC	0.135	0.000	ST	6	SHIPHANDLING TRAINING SYSTEM
Z1436	NTEC	0.759	0.775	ST	6	SURFACE WARFARE TRAINING ANALYSIS
Z1605	NTEC	2.541	4.635	ST	6C	TERRIER NEW THREAT UPGRADE TEAM TRAINER
Z1834	NTEC	0.000	2.500	ST	6	LANDING CRAFT AIR CUSHION OPERATOR TRAINER
		27.069	32.173			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64715N :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	27.069	32.173

(CONTINUED)

(CONTINUATION)

IV-B-6 : LISTING OF NAVY IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64716N						SUBMARINE WARFARE TRAINING DEVICES
S1735	NTEC	0.577	0.486	ST	6	GAS MANAGEMENT SYSTEM TRAINER
		------	------			
		0.577	0.486			TOTAL GOAL 6 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 64716N :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	0.577	0.486

(CONTINUATION)

IV-B-6 : LISTING OF AF IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
61102F						DEFENSE RESEARCH SCIENCES
2313-A5	AFOSR	2.857	2.976	ST	6	VISUAL INFORMATION PROCESSING
2313-T1	AFHRL	0.550	0.550	ET	6	MANPOWER MANAGEMENT
2313-T3	AFHRL	0.280	0.280	ST	6	FLYING TRAINING RESEARCH
2313-V2	AFAMRL	0.425	0.425	ST	6	BASIC VISION RESEARCH
		4.112	4.231		TOTAL GOAL 6 IN PE	

TOTAL FUNDING IN PROGRAM ELEMENT 61102F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	5.524	5.681

(CONTINUED)

(CONTINUATION)

IV-B-6 : LISTING OF AF IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
1121	AFHRL	2.250	1.800	ET	6	TECHNICAL TRAINING DEVELOPMENT
1123	AFHRL	2.745	2.800	ET	6	FLYING TRAINING DEVELOPMENT
1192	AFHRL	5.200	5.400	ST	6	ADVANCED SIMULATION FOR PILOT TRAINING
3017	AFHRL	0.000	0.617	ET	6	COMMAND AND CONTROL TRAINING
6114	AFHRL	1.700	1.800	ST	6	FLIGHT SIMULATOR TECHNOLOGY
		------	------			
		11.895	12.417			TOTAL GOAL 6 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62205F :		
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

(CONTINUATION)

IV-8-8 : LISTING OF AF IN GOAL 8 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
83227F						ADVANCED SIMULATOR TECHNOLOGY
2383	AFHRL	8.635	5.980	ST	8	ADVANCED VISUAL TECHNOLOGY SYSTEM
2743	AFHRL	0.098	0.441	ST	8	ADVANCED SIMULATOR CONCEPTS
		------	------			
		8.731	8.401			TOTAL GOAL 8 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 63227F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	8.731	8.401

(CONTINUATION)

IV-B-6 : LISTING OF AF IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63704F						MANPOWER AND PERSONNEL SYSTEMS TECHNOLOGY
2949	AFHRL	0.000	0.360	ET	6	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM
2951	AFHRL	0.130	0.350	ET	6	TRAINING DECISIONS SYSTEM
		0.130	0.710			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 63704F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	0.800	2.043

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(CONTINUATION)

IV-B-6 : LISTING OF AF IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
63751F						INNOVATIONS IN EDUCATION AND TRAINING
2361	AFHRL	0.500	0.000	ST	6	MAINTENANCE TRAINING SIMULATION
2362	AFHRL	0.700	0.700	HF	6	COMPUTER-BASED MAINTENANCE AIDS
2557	AFHRL	1.207	1.860	ST	6	INTEGRATED TRAINING MANAGEMENT SYSTEM (ITS)
		------	------			
		2.407	2.560	TOTAL GOAL 6 IN PE		

TOTAL FUNDING IN PROGRAM ELEMENT 63751F :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	4.500	5.081

(CONTINUATION)

IV-B-6 : LISTING OF AF IN GOAL 6 -- TRAINING SYSTEMS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
64227F						FLIGHT SIMULATOR DEVELOPMENT
2325	SIMSPO	3.650	3.620	ST	6D	SIMULATOR DEVELOPMENT ACTIVITIES
2769	SIMSPO	5.615	27.706	ST	6G	SIMULATOR UPDATE DEVELOPMENT
2851	SIMSPO	0.957	1.430	ST	6G	STANDARD DMA DATA BASE TRANSFORMATION PROGRAM
2901	SIMSPO	9.669	51.002	ST	6	B-1B WEAPON SYSTEM TRAINER (WST)
2902	SIMSPO	0.200	8.186	ST	6	T-46 OPERATIONAL FLIGHT TRAINER (OFT)
2903	SIMSPO	3.150	1.960	ST	6	F-15/F-16 SIMULATOR FOR AIR-TO-AIR COMBAT (SAAC)
		------	------			
		23.241	93.904			TOTAL GOAL 6 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 64227F :	FY84	FY85
	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	23.241	93.904

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IV-B-7 : LISTING OF  AF IN GOAL VAR--VARIOUS GOAL AREAS


            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
====================================================================================

62202F                                        AEROSPACE BIOTECHNOLOGY

  O6MD      AMD          8.800  9.500  HF  V     AEROSPACE MEDICAL
                                          A     DIVISION LABORATORY
                                          R     OPERATIONS
                         ------ ------
                         8.800  9.500     TOTAL GOAL VAR IN PE


    TOTAL FUNDING IN PROGRAM ELEMENT 62202F :              FY84     FY85
                                                           ------   ------
                      THE PRESIDENT'S BUDGET, JANUARY 1984 14.550   15.850

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(CONTINUATION)

IV-B-7 : LISTING OF AF IN GOAL VAR--VARIOUS GOAL AREAS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62205F						TRAINING AND SIMULATION TECHNOLOGY
06HT-1	AFHRL	1.615	1.642	ET	V A R	LABORATORY SUPPORT
06HT-2	AFHRL	4.843	4.926	ST	V A R	LABORATORY SUPPORT
		------	------			
		6.458	6.568			TOTAL GOAL VAR IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 62205F :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	22.477	23.285

(CONTINUATION)

IV-B-7 : LISTING OF AF IN GOAL VAR--VARIOUS GOAL AREAS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
62703F						PERSONNEL UTILIZATION TECHNOLOGY
06HP	AFHRL	3.999	4.042	MP	V A R	LABORATORY SUPPORT
		3.999	4.042			TOTAL GOAL VAR IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 62703F :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	7.000	8.757

V. MANPOWER, PERSONNEL AND TRAINING STUDIES
SPONSORED BY OASD(MI&L)
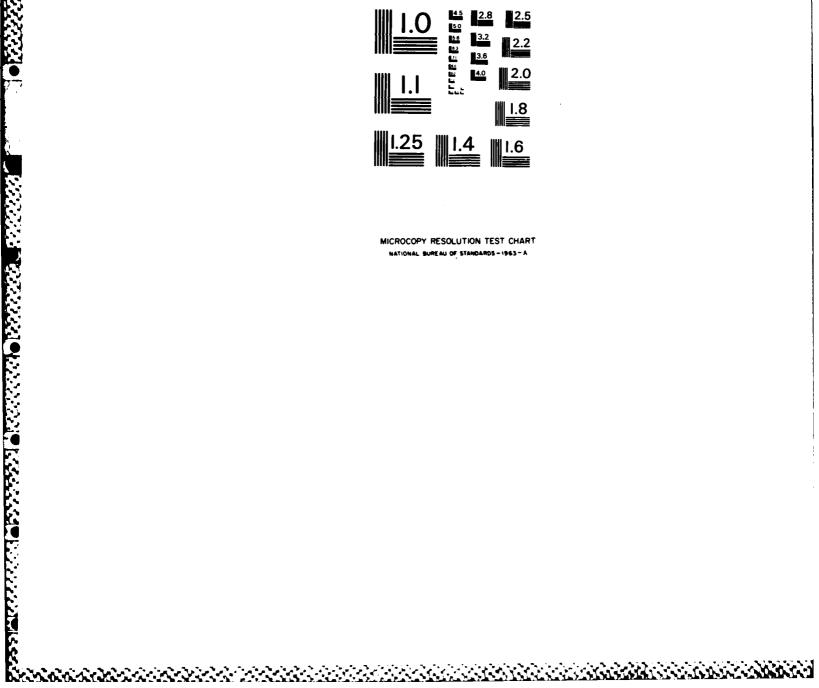
ITEM	TABLES
Projects Listed by Program Element	V-1
Projects Listed by Congressional Category within Program Element	V-2 thru V-3
Projects Listed by Goal within Program Element	V-4 thru V-8

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V-1 : LISTING OF MI&L PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
CP401	MI&L	0.054	0.000	MP	3A	EVALUATION OF THE EFFECTS OF LIFTING CIVILIAN CEILINGS UPON INDUSTRIAL FUND OPERATIONS
CP403	MI&L	0.035	0.000	MP	3A	PRODUCTIVITY PROGRAM ISSUES EVALUATION
CP405	MI&L	0.075	0.000	MP	3A	QUANTIFICATION OF PRODUCTIVITY CAPITAL INVESTMENT POTENTIAL
CP406	MI&L	0.030	0.000	MP	3C	IMPROVING POSITION MANAGEMENT
IN402	MI&L	0.250	0.300	MP	3B	BASE OPERATIONS PRODUCTIVITY IMPROVEMENT THROUGH PEER COMPETITION
LM401	MI&L	0.105	0.000	MP	2A	ACQUISITION PLANNING MANPOWER ANALYSIS - PHASE 3
LM402	MI&L	0.065	0.000	MP	2B	MAINTAINER UTILIZATION STUDY -- PHASE 2
LM421	MI&L	0.025	0.000	MP	5	ANALYSIS OF US ARMY FORCE STRUCTURE CHANGES, 1916-1985
MP401	MI&L	0.150	0.150	MP	1A	MANPOWER RESOURCES AND READINESS
MP402	MI&L	0.090	0.000	ET	6D	LINKAGE BETWEEN UNIT, CREW AND INDIVIDUAL TRAINING (PHASE III)
MP403	MI&L	0.090	0.000	ET	6D	TRAINING EFFECTIVENESS ANALYSIS (PHASE II)
MP404	MI&L	0.090	0.100	ET	6D	METHODS OF TRAINING

(CONTINUED)

MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

(CONTINUATION WITHIN PE 65109D)

V-1 : LISTING OF MI&L PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
MP405	MI&L	0.125	0.000	MP	3A	DEVELOPMENT OF MEASURES OF ON-THE-JOB PERFORMANCE
MP408	MI&L	0.100	0.150	ET	6	DEFENSE TRAINING DATA & ANALYSIS CENTER
MP413	MI&L	0.075	0.000	MP	2A	ENLISTED AND OFFICER RETENTION
MP418	MI&L	0.320	0.000	MP	2	SURVEY OF MILITARY FAMILIES
MP419	MI&L	0.100	0.000	MP	2	EFFECTS OF THE FAMILY ON PERSONNEL RETENTION
MR401	MI&L	0.175	0.000	MP	2A	WARMAPS ANALYTIC SUPPORT
MR406	MI&L	0.100	0.000	MP	1G	MOBILIZATION MANPOWER PLANNERS HANDBOOK
PI405	MI&L	0.100	0.050	MP	5	MODELING RESOURCES-TO-READINESS-TO-SUSTAINABILITY
PI406	MI&L	0.100	0.050	MP	5B	OVERSIGHT OF RESOURCES AND CAPABILITY FOR LOGISTICS EFFECTIVENESS
RA404	MI&L	0.025	0.000	MP	1D	COST ANALYSIS OF FULL-TIME SUPPORT TO RESERVE COMPONENTS OF THE ARMY AND THE AIR FORCE
RA408	MI&L	0.025	0.000	MP	1G	EMERGENCY ACTION PACKAGE (EAP) FOR RC MOBILIZATION
RA409	MI&L	0.150	0.000	MP	1G	MOBILIZATION MAILGRAMS
RA410	MI&L	0.075	0.000	MP	3A	GUARD AND RESERVE PERFORMANCE INDICES
		2.529	0.800			TOTAL IN PE

(CONTINUED)

(CONTINUATION)

V-1 : LISTING OF MI&L PROJECTS

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              PERFORMING    FY84    FY85 CONG
PE/PROJECT    ORGANIZ.      ($M)    ($M) CAT  GOAL  PE/PROJECT TITLES
==========================================================================
  TOTAL FUNDING IN PROGRAM ELEMENT 65109D :            FY84    FY85
                                                       ------  ------
              THE PRESIDENT'S BUDGET, JANUARY 1984     2.529   0.800

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(CONTINUATION)

V-1 : LISTING OF MI&L PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
IN403	MI&L	0.190	0.000	MP	3B	IMPROVING EFFICIENCY OF BASE OPERATING SUPPORT FUNCTIONS
JM401	MI&L	0.805	0.850	MP	2	YOUTH ATTITUDE TRACKING SURVEY II (YATS II)
JM402	MI&L	0.450	0.500	MP	2	VETERANS ATTITUDE TRACKING STUDY (VATS)
JM403	MI&L	0.100	0.100	MP	2	NATIONAL LONGITUDINAL SURVEY
JM404	MI&L	0.100	0.100	MP	2	ENLISTMENT STUDIES
JM405	MI&L	0.075	0.100	MP	2	ANALYSIS OF MARKET SURVEY INTENTION INFORMATION
JM408	MI&L	0.075	0.075	MP	2C	RECRUITING EFFECTS OF LOCAL ADVERTISING
LM414	MI&L	0.375	0.380	MP	1	STRATEGIES FOR IMPROVING MAINTENANCE CAPABILITY
LM415	MI&L	0.245	0.475	MP	5B	STRATEGIES FOR IMPROVING LOGISTICS PREPAREDNESS
MP407	MI&L	0.080	0.200	MP	5	MANPOWER IMPACTS ON UNIT READINESS
MP409	MI&L	0.250	0.000	MP	2C	ENLISTMENT BONUS EXPERIMENT
MP410	MI&L	0.275	0.000	MP	2C	MARGINAL COST OF RECRUITING AND SUPPLY ANALYSIS
MP414	MI&L	0.200	0.000	MP	1A	DEFENSE OFFICER FORCE PROJECTION MODEL
MP415	MI&L	0.100	0.000	MP	2B	SRB SKILLS ALLOCATION SYSTEM

(CONTINUED)

(CONTINUATION WITHIN PE 92198D)

V-1 : LISTING OF MI&L PROJECTS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
MP417	MI&L	0.125	0.000	MP	2	ANALYSIS OF 1983 APPLICANT SURVEY
MP422	MI&L	0.100	0.175	MP	1A	DEFENSE ENLISTED FORCE PROJECTION MODEL
PI413	MI&L	0.125	0.000	MP	1	TOTAL FORCE COMPOSITION
RA401	MI&L	0.200	0.000	MP	1D	ECONOMIC ANALYSIS: RC WITHIN TOTAL FORCE, PHASE II
RA407	MI&L	0.200	0.000	MP	2E	EFFECT OF INCENTIVES ON PARTICIPATING ARMY GUARD AND RESERVE UNITS
RA415	MI&L	0.125	0.150	ET	6	TECHNICAL LOGISTIC SKILL DEVELOPMENT IN THE RESERVE COMPONENT
		------	------			
		4.195	3.105		TOTAL IN PE	

TOTAL FUNDING IN PROGRAM ELEMENT 92198D :		FY84	FY85
		------	------
THE PRESIDENT'S BUDGET, JANUARY 1984		4.195	3.105

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V-2 : LISTING OF MI&L  IN EDUCATION AND TRAINING
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PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
MP402	MI&L	0.090	0.000	ET	6D	LINKAGE BETWEEN UNIT, CREW AND INDIVIDUAL TRAINING (PHASE III)
MP403	MI&L	0.090	0.000	ET	6D	TRAINING EFFECTIVENESS ANALYSIS (PHASE II)
MP404	MI&L	0.090	0.100	ET	6D	METHODS OF TRAINING
MP408	MI&L	0.100	0.150	ET	6	DEFENSE TRAINING DATA & ANALYSIS CENTER
	TOTAL:	0.370	0.250	(EDUCATION AND TRAINING IN PE)		

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    TOTAL FUNDING IN PROGRAM ELEMENT 65109D :              FY84      FY85
                                                          ------    ------
                     THE PRESIDENT'S BUDGET, JANUARY 1984  2.529     0.800

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(CONTINUATION)

V-2 : LISTING OF MI&L IN EDUCATION AND TRAINING

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
RA415	MI&L	0.125	0.150	ET	6	TECHNICAL LOGISTIC SKILL DEVELOPMENT IN THE RESERVE COMPONENT
	TOTAL:	0.125	0.150			(EDUCATION AND TRAINING IN PE)

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 92198D :			
THE PRESIDENT'S BUDGET, JANUARY 1984		4.195	3.105

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V-3 : LISTING OF MI&L IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
CP401	MI&L	0.054	0.000	MP	3A	EVALUATION OF THE EFFECTS OF LIFTING CIVILIAN CEILINGS UPON INDUSTRIAL FUND OPERATIONS
CP403	MI&L	0.035	0.000	MP	3A	PRODUCTIVITY PROGRAM ISSUES EVALUATION
CP405	MI&L	0.075	0.000	MP	3A	QUANTIFICATION OF PRODUCTIVITY CAPITAL INVESTMENT POTENTIAL
CP406	MI&L	0.030	0.000	MP	3C	IMPROVING POSITION MANAGEMENT
IN402	MI&L	0.250	0.300	MP	3B	BASE OPERATIONS PRODUCTIVITY IMPROVEMENT THROUGH PEER COMPETITION
LM401	MI&L	0.105	0.000	MP	2A	ACQUISITION PLANNING MANPOWER ANALYSIS - PHASE 3
LM402	MI&L	0.065	0.000	MP	2B	MAINTAINER UTILIZATION STUDY -- PHASE 2
LM421	MI&L	0.025	0.000	MP	5	ANALYSIS OF US ARMY FORCE STRUCTURE CHANGES, 1916-1985
MP401	MI&L	0.150	0.150	MP	1A	MANPOWER RESOURCES AND READINESS
MP405	MI&L	0.125	0.000	MP	3A	DEVELOPMENT OF MEASURES OF ON-THE-JOB PERFORMANCE
MP413	MI&L	0.075	0.000	MP	2A	ENLISTED AND OFFICER RETENTION

(CONTINUED)

(CONTINUATION WITHIN PE 65109D)

V-3 : LISTING OF MI&L IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
MP418	MI&L	0.320	0.000	MP	2	SURVEY OF MILITARY FAMILIES
MP419	MI&L	0.100	0.000	MP	2	EFFECTS OF THE FAMILY ON PERSONNEL RETENTION
MR401	MI&L	0.175	0.000	MP	2A	WARMAPS ANALYTIC SUPPORT
MR406	MI&L	0.100	0.000	MP	1G	MOBILIZATION MANPOWER PLANNERS HANDBOOK
PI405	MI&L	0.100	0.050	MP	5	MODELING RESOURCES-TO-READINESS-TO-SUSTAINABILITY
PI406	MI&L	0.100	0.050	MP	5B	OVERSIGHT OF RESOURCES AND CAPABILITY FOR LOGISTICS EFFECTIVENESS
RA404	MI&L	0.025	0.000	MP	1D	COST ANALYSIS OF FULL-TIME SUPPORT TO RESERVE COMPONENTS OF THE ARMY AND THE AIR FORCE
RA408	MI&L	0.025	0.000	MP	1G	EMERGENCY ACTION PACKAGE (EAP) FOR RC MOBILIZATION
RA409	MI&L	0.150	0.000	MP	1G	MOBILIZATION MAILGRAMS
RA410	MI&L	0.075	0.000	MP	3A	GUARD AND RESERVE PERFORMANCE INDICES
TOTAL:		2.159	0.550			(MANPOWER AND PERSONNEL IN PE)

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 65109D :		
THE PRESIDENT'S BUDGET, JANUARY 1984	2.529	0.800

(CONTINUED)

(CONTINUATION)

V-3 : LISTING OF MI&L IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
IN403	MI&L	0.190	0.000	MP	3B	IMPROVING EFFICIENCY OF BASE OPERATING SUPPORT FUNCTIONS
JM401	MI&L	0.805	0.850	MP	2	YOUTH ATTITUDE TRACKING SURVEY II (YATS II)
JM402	MI&L	0.450	0.500	MP	2	VETERANS ATTITUDE TRACKING STUDY (VATS)
JM403	MI&L	0.100	0.100	MP	2	NATIONAL LONGITUDINAL SURVEY
JM404	MI&L	0.100	0.100	MP	2	ENLISTMENT STUDIES
JM405	MI&L	0.075	0.100	MP	2	ANALYSIS OF MARKET SURVEY INTENTION INFORMATION
JM408	MI&L	0.075	0.075	MP	2C	RECRUITING EFFECTS OF LOCAL ADVERTISING
LM414	MI&L	0.375	0.380	MP	1	STRATEGIES FOR IMPROVING MAINTENANCE CAPABILITY
LM415	MI&L	0.245	0.475	MP	5B	STRATEGIES FOR IMPROVING LOGISTICS PREPAREDNESS
MP407	MI&L	0.080	0.200	MP	5	MANPOWER IMPACTS ON UNIT READINESS
MP409	MI&L	0.250	0.000	MP	2C	ENLISTMENT BONUS EXPERIMENT
MP410	MI&L	0.275	0.000	MP	2C	MARGINAL COST OF RECRUITING AND SUPPLY ANALYSIS
MP414	MI&L	0.200	0.000	MP	1A	DEFENSE OFFICER FORCE PROJECTION MODEL

(CONTINUATION WITHIN PE 92198D)

V-3 : LISTING OF MI&L IN MANPOWER AND PERSONNEL

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
MP415	MI&L	0.100	0.000	MP	2B	SRB SKILLS ALLOCATION SYSTEM
MP417	MI&L	0.125	0.000	MP	2	ANALYSIS OF 1983 APPLICANT SURVEY
MP422	MI&L	0.100	0.175	MP	1A	DEFENSE ENLISTED FORCE PROJECTION MODEL
PI413	MI&L	0.125	0.000	MP	1	TOTAL FORCE COMPOSITION
RA401	MI&L	0.200	0.000	MP	1D	ECONOMIC ANALYSIS: RC WITHIN TOTAL FORCE, PHASE II
RA407	MI&L	0.200	0.000	MP	2E	EFFECT OF INCENTIVES ON PARTICIPATING ARMY GUARD AND RESERVE.UNITS
TOTAL:		4.070	2.955	(MANPOWER AND PERSONNEL IN PE)		

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 92198D :		
THE PRESIDENT'S BUDGET, JANUARY 1984	4.195	3.105

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V-4 : LISTING OF MI&L IN GOAL 1 -- MANAGEMENT TRADE-OFFS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
MP401	MI&L	0.150	0.150	MP	1A	MANPOWER RESOURCES AND READINESS
MR406	MI&L	0.100	0.000	MP	1G	MOBILIZATION MANPOWf PLANNERS HANDBOOK
RA404	MI&L	0.025	0.000	MP	1D	COST ANALYSIS OF FULL-TIME SUPPORT RESERVE COMPONENTS ARMY AND THE AIR FO.
RA408	MI&L	0.025	0.000	MP	1G	EMERGENCY ACTION PACKAGE (EAP) FOR RC MOBILIZATION
RA409	MI&L	0.150	0.000	MP	1G	MOBILIZATION MAILGRAMS
		0.450	0.150			TOTAL GOAL 1 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 65109D :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.529	0.800

(CONTINUATION)

V-4 : LISTING OF MI&L IN GOAL 1 -- MANAGEMENT TRADE-OFFS

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
LM414	MI&L	0.375	0.380	MP	1	STRATEGIES FOR IMPROVING MAINTENANCE CAPABILITY
MP414	MI&L	0.200	0.000	MP	1A	DEFENSE OFFICER FORCE PROJECTION MODEL
MP422	MI&L	0.100	0.175	MP	1A	DEFENSE ENLISTED FORCE PROJECTION MODEL
PI413	MI&L	0.125	0.000	MP	1	TOTAL FORCE COMPOSITION
RA401	MI&L	0.200	0.000	MP	1D	ECONOMIC ANALYSIS: RC WITHIN TOTAL FORCE, PHASE II
		------	------			
		1.000	0.555			TOTAL GOAL 1 IN PE

		FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 92198D :		------	------
	THE PRESIDENT'S BUDGET, JANUARY 1984	4.195	3.105

V-5 : LISTING OF MI&L IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
LM401	MI&L	0.105	0.000	MP	2A	ACQUISITION PLANNING MANPOWER ANALYSIS - PHASE 3
LM402	MI&L	0.065	0.000	MP	2B	MAINTAINER UTILIZATION STUDY -- PHASE 2
MP413	MI&L	0.075	0.000	MP	2A	ENLISTED AND OFFICER RETENTION
MP418	MI&L	0.320	0.000	MP	2	SURVEY OF MILITARY FAMILIES
MP419	MI&L	0.100	0.000	MP	2	EFFECTS OF THE FAMILY ON PERSONNEL RETENTION
MR401	MI&L	0.175	0.000	MP	2A	WARMAPS ANALYTIC SUPPORT
		0.840	0.000			TOTAL GOAL 2 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 65109D :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.529	0.800

(CONTINUATION)

V-5 : LISTING OF MI&L IN GOAL 2 -- ACCESSION AND RETENTION

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
JM401	MI&L	0.805	0.850	MP	2	YOUTH ATTITUDE TRACKING SURVEY II (YATS II)
JM402	MI&L	0.450	0.500	MP	2	VETERANS ATTITUDE TRACKING STUDY (VATS)
JM403	MI&L	0.100	0.100	MP	2	NATIONAL LONGITUDINAL SURVEY
JM404	MI&L	0.100	0.100	MP	2	ENLISTMENT STUDIES
JM405	MI&L	0.075	0.100	MP	2	ANALYSIS OF MARKET SURVEY INTENTION INFORMATION
JM408	MI&L	0.075	0.075	MP	2C	RECRUITING EFFECTS OF LOCAL ADVERTISING
MP409	MI&L	0.250	0.000	MP	2C	ENLISTMENT BONUS EXPERIMENT
MP410	MI&L	0.275	0.000	MP	2C	MARGINAL COST OF RECRUITING AND SUPPLY ANALYSIS
MP415	MI&L	0.100	0.000	MP	2B	SRB SKILLS ALLOCATION SYSTEM
MP417	MI&L	0.125	0.000	MP	2	ANALYSIS OF 1983 APPLICANT SURVEY
RA407	MI&L	0.200	0.000	MP	2E	EFFECT OF INCENTIVES ON PARTICIPATING ARMY GUARD AND RESERVE UNITS
		------	------			
		2.555	1.725			TOTAL GOAL 2 IN PE

(CONTINUATION)

V-5 : LISTING OF MI&L IN GOAL 2 -- ACCESSION AND RETENTION

```
              PERFORMING   FY84   FY85 CONG
PE/PROJECT   ORGANIZ.    ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
===================================================================================
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TOTAL FUNDING IN PROGRAM ELEMENT 92198D :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	4.195	3.105

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V-6 : LISTING OF MI&L IN GOAL 3 -- UNIT PRODUCTIVITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
65109D						PROGRAM-WIDE MANAGEMENT
CP401	MI&L	0.054	0.000	MP	3A	EVALUATION OF THE EFFECTS OF LIFTING CIVILIAN CEILINGS UPON INDUSTRIAL FUND OPERATIONS
CP403	MI&L	0.035	0.000	MP	3A	PRODUCTIVITY PROGRAM ISSUES EVALUATION
CP405	MI&L	0.075	0.000	MP	3A	QUANTIFICATION OF PRODUCTIVITY CAPITAL INVESTMENT POTENTIAL
CP406	MI&L	0.030	0.000	MP	3C	IMPROVING POSITION MANAGEMENT
IN402	MI&L	0.250	0.300	MP	3B	BASE OPERATIONS PRODUCTIVITY IMPROVEMENT THROUGH PEER COMPETITION
MP405	MI&L	0.125	0.000	MP	3A	DEVELOPMENT OF MEASURES OF ON-THE-JOB PERFORMANCE
RA410	MI&L	0.075	0.000	MP	3A	GUARD AND RESERVE PERFORMANCE INDICES
		0.644	0.300			TOTAL GOAL 3 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 65109D :

	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	2.529	0.800

(CONTINUATION)

V-8 : LISTING OF MI&L IN GOAL 3 -- UNIT PRODUCTIVITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
IN403	MI&L	0.190	0.000	MP	3B	IMPROVING EFFICIENCY OF BASE OPERATING SUPPORT FUNCTIONS
		------	------			
		0.190	0.000			TOTAL GOAL 3 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 92198D :	------	------
THE PRESIDENT'S BUDGET, JANUARY 1984	4.195	3.105

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V-7 : LISTING OF MI&L IN GOAL 5 -- IMPROVED SUSTAINABILITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 ($M)	FY85 ($M)	CONG CAT	GOAL	PE/PROJECT TITLES
85109D						PROGRAM-WIDE MANAGEMENT
LM421	MI&L	0.025	0.000	MP	5	ANALYSIS OF US ARMY FORCE STRUCTURE CHANGES, 1916-1985
PI405	MI&L	0.100	0.050	MP	5	MODELING RESOURCES-TO-READINESS-TO-SUSTAINABILITY
PI406	MI&L	0.100	0.050	MP	5B	OVERSIGHT OF RESOURCES AND CAPABILITY FOR LOGISTICS EFFECTIVENESS
		0.225	0.100			TOTAL GOAL 5 IN PE

	FY84	FY85
TOTAL FUNDING IN PROGRAM ELEMENT 85109D :		
THE PRESIDENT'S BUDGET, JANUARY 1984	2.529	0.800

(CONTINUED)

(CONTINUATION)

V-7 : LISTING OF MI&L IN GOAL 5 -- IMPROVED SUSTAINABILITY

PE/PROJECT	PERFORMING ORGANIZ.	FY84 (SM)	FY85 (SM)	CONG CAT	GOAL	PE/PROJECT TITLES
92198D						MI&L O&M MANAGEMENT STUDIES
LM415	MI&L	0.245	0.475	MP	5B	STRATEGIES FOR IMPROVING LOGISTICS PREPAREDNESS
MP407	MI&L	0.080	0.200	MP	5	MANPOWER IMPACTS ON UNIT READINESS
		0.325	0.675			TOTAL GOAL 5 IN PE

TOTAL FUNDING IN PROGRAM ELEMENT 92198D :	FY84	FY85
THE PRESIDENT'S BUDGET, JANUARY 1984	4.195	3.105

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<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

V-8 : LISTING OF MI&L  IN GOAL 6 -- TRAINING SYSTEMS


               PERFORMING   FY84    FY85 CONG
PE/PROJECT     ORGANIZ.     ($M)    ($M) CAT  GOAL  PE/PROJECT TITLES
===============================================================================


65109D                                            PROGRAM-WIDE MANAGEMENT

  MP402        MI&L        0.090   0.000  ET   6D   LINKAGE BETWEEN UNIT,
                                                    CREW AND INDIVIDUAL
                                                    TRAINING (PHASE III)

  MP403        MI&L        0.090   0.000  ET   6D   TRAINING EFFECTIVENESS
                                                    ANALYSIS (PHASE II)

  MP404        MI&L        0.090   0.100  ET   6D   METHODS OF TRAINING

  MP406        MI&L        0.100   0.150  ET   6    DEFENSE TRAINING DATA &
                                                    ANALYSIS CENTER
                          ------  ------
                          0.370   0.250   TOTAL GOAL 6 IN PE


   TOTAL FUNDING IN PROGRAM ELEMENT 65109D :             FY84      FY85
                                                        ------    ------
                    THE PRESIDENT'S BUDGET, JANUARY 1984  2.529     0.800

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(CONTINUED)

(CONTINUATION)

V-8 : LISTING OF MI&L IN GOAL 6 -- TRAINING SYSTEMS
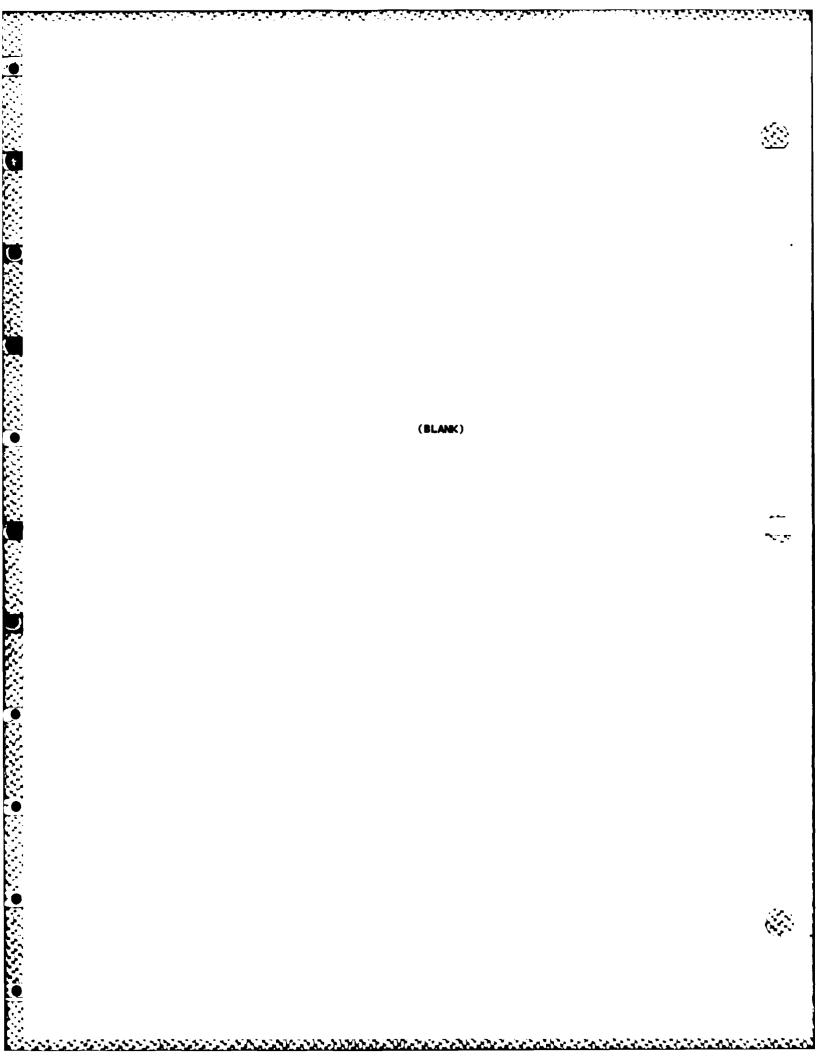
```
            PERFORMING   FY84   FY85 CONG
PE/PROJECT  ORGANIZ.     ($M)   ($M) CAT  GOAL  PE/PROJECT TITLES
================================================================================

92198D                                        MI&L O&M MANAGEMENT STUDIES

  RA415     MI&L       0.125  0.150   ET  6    TECHNICAL LOGISTIC SKILL
                                              DEVELOPMENT IN THE
                                              RESERVE COMPONENT
                       ------ ------
                       0.125  0.150    TOTAL GOAL 6 IN PE
```

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    TOTAL FUNDING IN PROGRAM ELEMENT 92198D :          FY84     FY85
                                                       ------   ------
              THE PRESIDENT'S BUDGET, JANUARY 1984     4.195    3.105
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VI. APPENDIXES

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APPENDIX A

CONGRESSIONAL CATEGORIES

ET EDUCATION AND TRAINING

    ET1 -- Education and Training (6.1)
    ET2 -- Curriculum Development
    ET3 -- Methods and Media
    ET4 -- Management Systems
    ET5 -- Effectiveness Evaluation
    ET6 -- Technology Transfer
    ET7 -- Special Applications

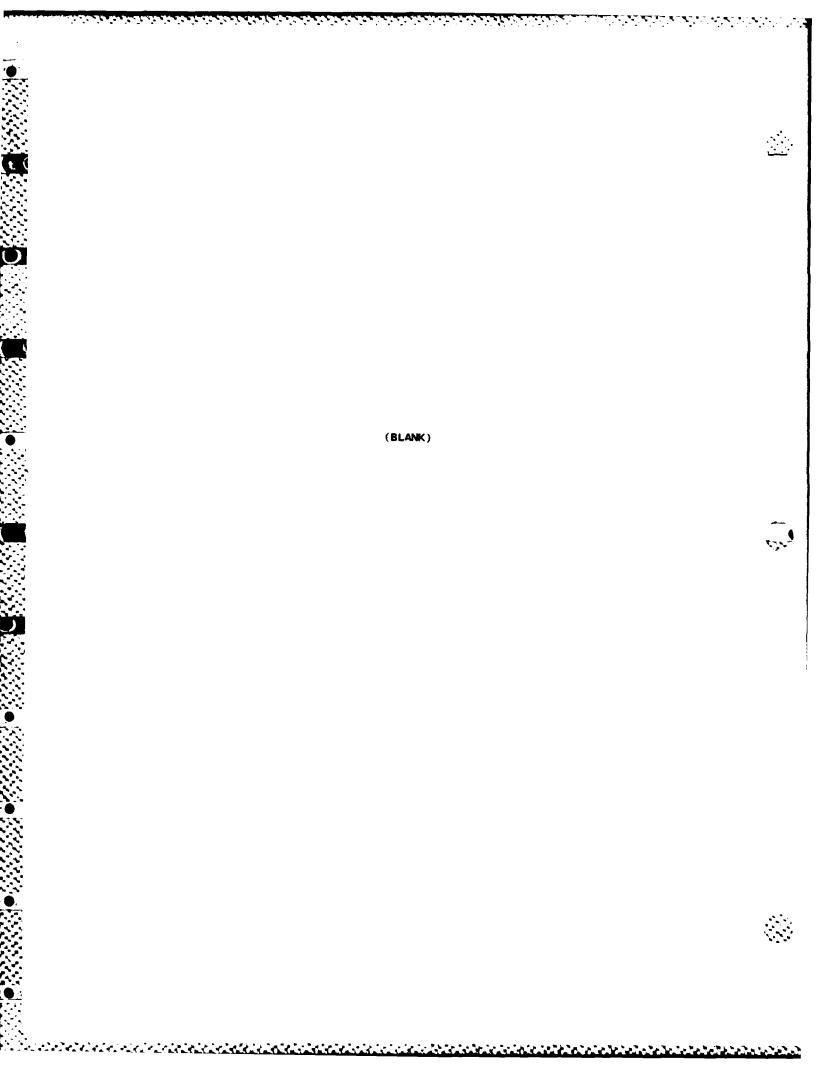**HF HUMAN FACTORS**

    HF1 -- Human Factors (6.1)
    HF2 -- Human Related Studies
    HF3 -- Human-Machine Related Studies
    HF4 -- Human-Machine-Mission Related Studies

MP MANPOWER AND PERSONNEL

    MP1 -- Manpower and Personnel (6.1)
    MP2 -- Occupational Requirements and Structures
    MP3 -- Resources Management
    MP4 -- Recruitment, Accession and Placement
    MP5 -- Career Development
    MP6 -- Productivity and Effectiveness
    MP7 -- Civilian and Military Workforce Development

ST SIMULATION AND TRAINING DEVICES

    ST1 -- Visual Simulation Technology
    ST2 -- Force/Motion Cue Simulation Technology
    ST3 -- Sensor Simulation Technology
    ST4 -- Instructional Features
    ST5 -- Maintenance Training Simulation
    ST6 -- Weapons Fire Simulation
    ST7 -- Specialized Training Devices

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APPENDIX B

MANPOWER, PERSONNEL AND TRAINING GOALS AND SUB-GOALS
----

1. Management Trade-offs
   A. Manpower Models and Trade-Offs
   B. Compensation Issues
   C. Career Issues
   D. Reserve Issues
   E. Military-Civilian Issues
   F. Organizational Issues
   G. Mobilization Issues
   H. Equal Opportunity Issues
   I. National Trends
   J. Presidential and Congressional Issues
   K. Studies with Foreign Affairs/Policy Implications

2. Accession and Retention
   A. Forecasting of Supply
   B. Skills and Specialties
   C. Recruiting System Issues
   D. Selection and Classification
   E. Reserve Manpower

3. Unit Productivity
   A. Measurement/Prediction of Individual and Unit
   B. Enhancement of Individual and Unit
   C. Effectiveness/Analysis and Trade-offs of methods and
      processes

4. Designing for System Readiness
   A. Front-end Analytical Techniques
   B. Human Capabilities and Design Criteria
   C. Techniques/Methods for Improved Operability
   D. Techniques/Methods for Improved Maintainability
   E. Test, Evaluation and Effectiveness Measurement Methods

GOALS AND SUBGOALS
(continued)

5. Improved Sustainability
   A. Maintaining Individual and Unit Capabilities
   B. Improved Logistical Support
   C. Deficiency Measurement and Improvement
   D. Improved Technical Documentation
   E. Wartime Factors of Special Concern
   F. Routine Effectiveness Issues
   G. Combat Effectiveness Issues

6. Training Systems
   A. Management Trade-offs
   B. Acquisition Issues
   C. Utilization Issues
   D. Cost-Effectiveness Issues
   E. Design and Analytical Issues and Methods
   F. Improved Instructional Strategies
   G. Critical Technologies
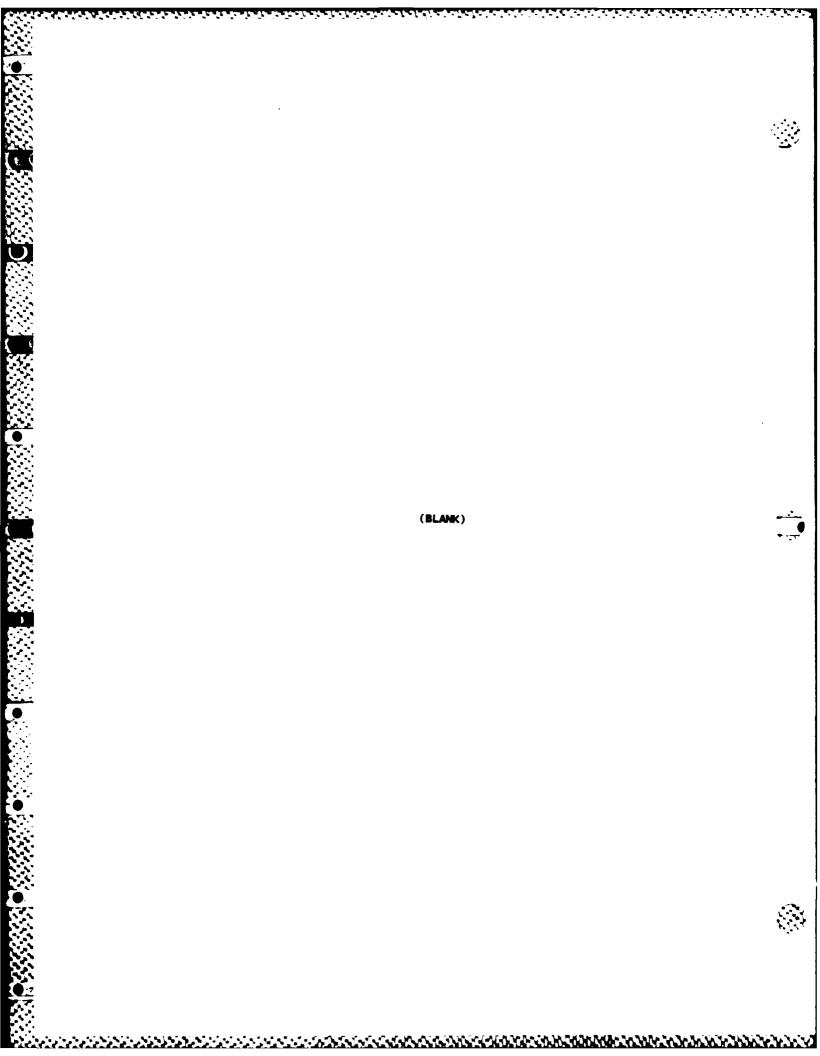   H. Support System Issues
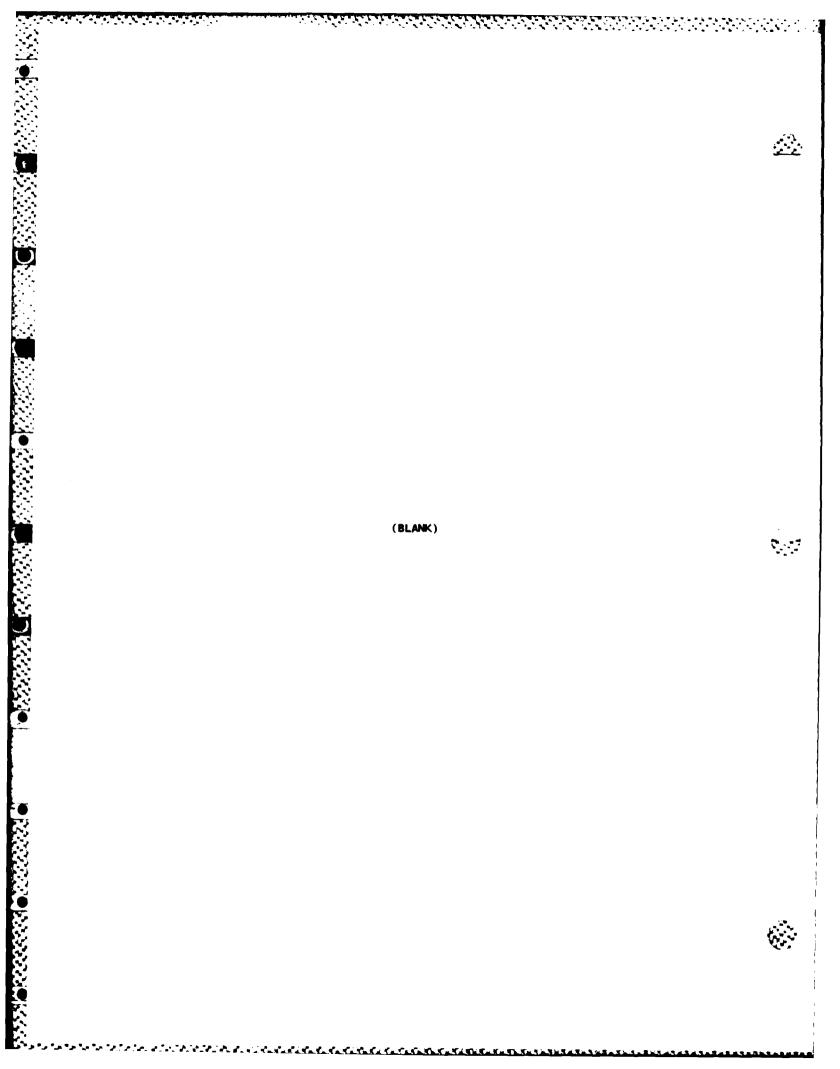
Various

APPENDIX C

PROJECTS TO BE COMPLETED IN FY84
(BY SERVICE)

PE	PROJ	FY84($M)	TITLE
ARMY			
		0.000	TOTAL FOR ARMY
NAVY			
62763N	F63-528	0.190	PERSONNEL PERFORMANCE ASSESSMENT AND ENHANCEMENT
64703N	X1328	2.823	BATTLE GROUP TACTICAL TRAINER
	Z1385	0.462	COMPUTER ADAPTIVE TESTING
64715N	Z1130	0.196	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY
	Z1131	0.821	DEVICE 14E19/14E25/14E25A MODIFICATIONS
	Z1268	1.658	AN/SQR-18A SONAR OPERATOR/TEAM TRAINER
	Z1435	0.135	SHIPHANDLING TRAINING SYSTEM
		6.285	TOTAL FOR NAVY
AIR FORCE			
63751F	2361	0.500	MAINTENANCE TRAINING SIMULATION
		0.500	TOTAL FOR AIR FORCE

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PROJECTS TO BE COMPLETED IN FY84
(BY CONGRESSIONAL CATEGORY)

PE	PROJ	FY84($M)	TITLE

EDUCATION AND TRAINING

		0.000	TOTAL FOR EDUCATION AND TRAINING

HUMAN FACTORS

NAVY	62763N	F63-528	0.190	PERSONNEL PERFORMANCE ASSESSMENT AND ENHANCEMENT
			0.190	TOTAL FOR HUMAN FACTORS

MANPOWER AND PERSONNEL

NAVY	64703N	Z1385	0.462	COMPUTER ADAPTIVE TESTING
			0.462	TOTAL FOR MANPOWER AND PERSONNEL

SIMULATION AND TRAINING DEVICES

NAVY		X1328	2.823	BATTLE GROUP TACTICAL TRAINER
NAVY	64715N	Z1130	0.196	NAVAL TACTICAL DATA SYSTEM (NTDS) LABORATORY
NAVY		Z1131	0.821	DEVICE 14E19/14E25/14E25A MODIFICATIONS
NAVY		Z1268	1.658	AN/SQR-18A SONAR OPERATOR/TEAM TRAINER
NAVY		Z1435	0.135	SHIPHANDLING TRAINING SYSTEM
AF	63751F	2361	0.500	MAINTENANCE TRAINING SIMULATION
			6.133	TOTAL FOR SIMULATION AND TRAINING DEVICES

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APPENDIX D

PROJECTS TO BE INITIATED IN FY85
(BY SERVICE)

PE	PROJ	FY85($M)	TITLE
ARMY			
63738A	A225	3.638	NON-SYSTEM TRAINING DEVICES (NSTD) ARTILLERY/AIR DEFENSE ENGINEER
		3.623	TOTAL FOR ARMY
NAVY			
63727N	T1805	5.023	NAVY AUTOMATED PUBLISHING SYSTEM
	T1806	2.171	LOGISTICS SYSTEMS INFORMATION NETWORK
64703N	Z1822	1.179	MANPOWER AND HUMAN FACTORS ENGINEERING
	Z1823	5.326	TRAINING AND TRAINING DEVICE SYSTEMS DEVELOPMENT
64715N	Z1834	2.500	LANDING CRAFT AIR CUSHION OPERATOR TRAINER
		16.199	TOTAL FOR NAVY
AIR FORCE			
62205F	3017	0.617	COMMAND AND CONTROL TRAINING
63365F	2992	0.701	SPACE BIOTECHNOLOGY
63704F	2949	0.360	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM
63751F	2745	0.981	LOGISTICS FOR COMBAT READINESS MAINTENANCE
		2.659	TOTAL FOR AIR FORCE
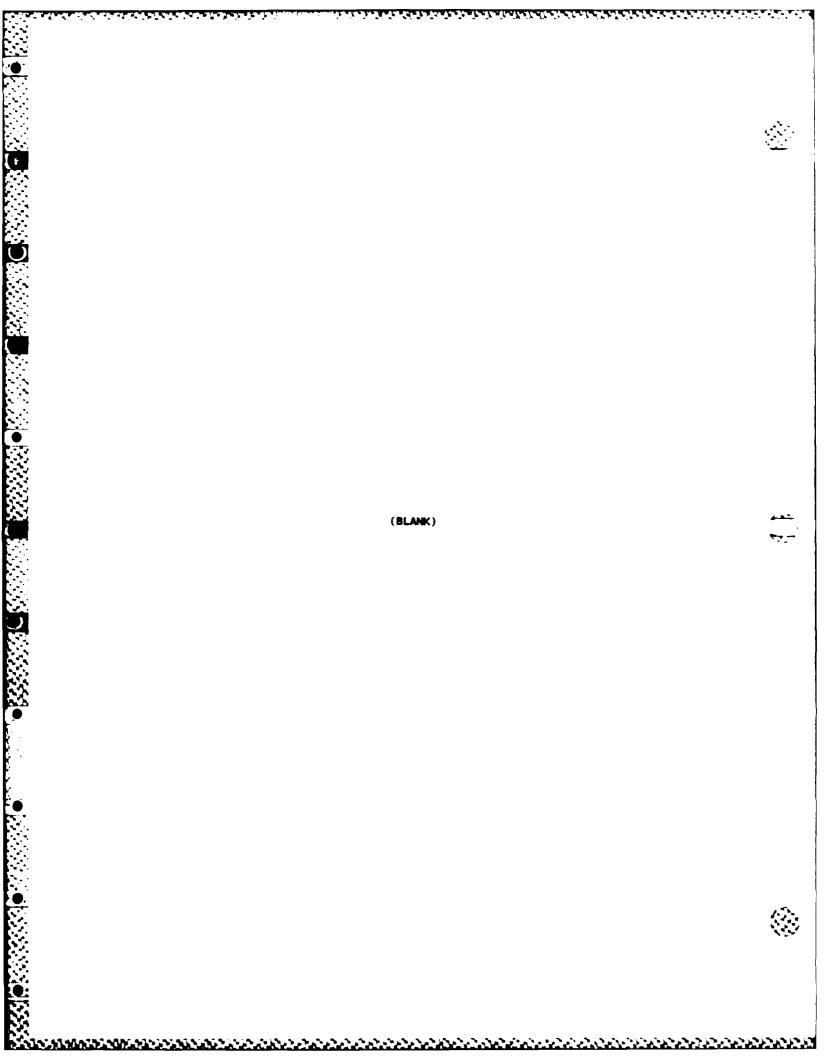
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PROJECTS TO BE INITIATED IN FY85
(BY CONGRESSIONAL CATEGORY)

	PE	PROJ	FY85($M)	TITLE
EDUCATION AND TRAINING				
NAVY	63727N	T1805	5.023	NAVY AUTOMATED PUBLISHING SYSTEM
NAVY		T1806	2.171	LOGISTICS SYSTEMS INFORMATION NETWORK
AF	62205F	3017	0.617	COMMAND AND CONTROL TRAINING
AF	63704F	2949	0.360	BASIC SKILLS ASSESSMENT AND ENHANCEMENT SYSTEM
			8.171	TOTAL FOR EDUCATION AND TRAINING
HUMAN FACTORS				
AF	63365F	2992	0.701	SPACE BIOTECHNOLOGY
AF	63751F	2745	0.981	LOGISTICS FOR COMBAT READINESS MAINTENANCE
			1.682	TOTAL FOR MANPOWER AND PERSONNEL
SIMULATION AND TRAINING DEVICES				
ARMY	63738A	A225	3.638	NON-SYSTEM TRAINING DEVICES (NSTD) ARTILLERY/AIR DEFENSE ENGINEER
NAVY	64703N	Z1822	1.179	MANPOWER AND HUMAN FACTORS ENGINEERING
NAVY		Z1823	5.326	TRAINING AND TRAINING DEVICE SYSTEMS DEVELOPMENT
NAVY	64715N	Z1834	2.500	LANDING CRAFT AIR CUSHION OPERATOR TRAINER
			12.643	TOTAL FOR SIMULATION AND TRAINING DEVICES

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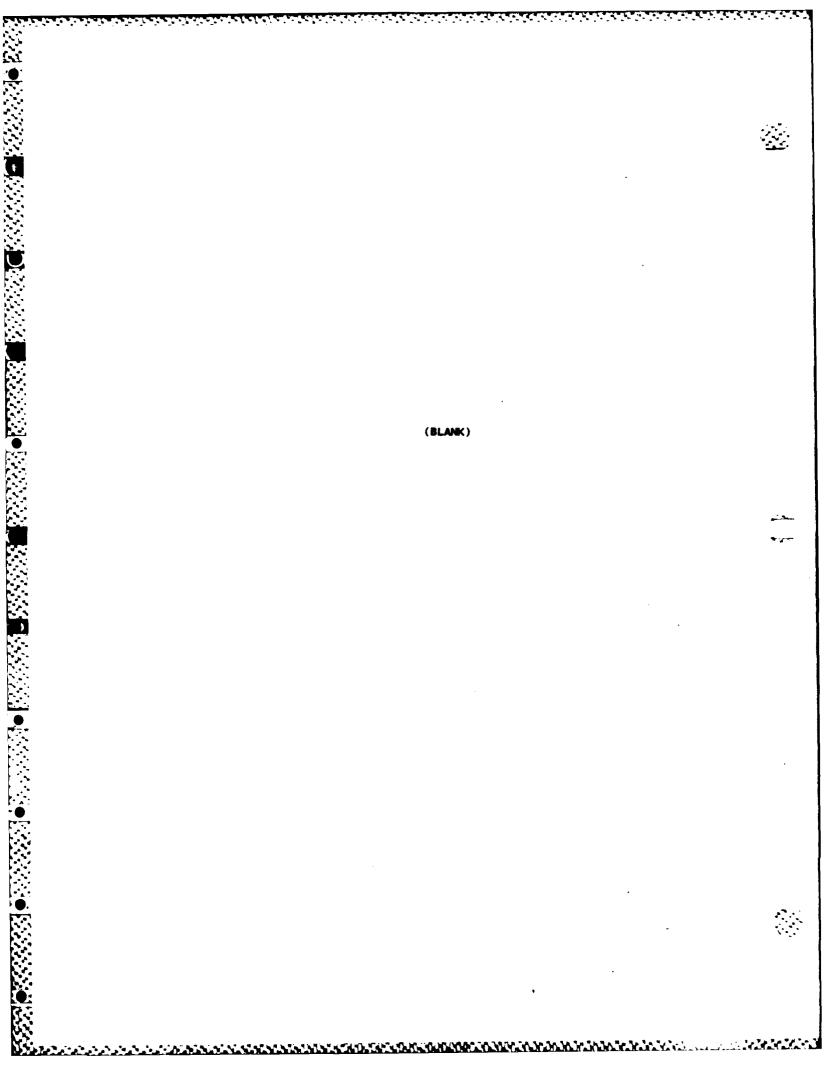
APPENDIX E

RELEVANT POLICY-LEVEL MEMORANDUM
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17 AUG 1978	Manpower and Logistics Concerns for New Major Systems
No Date	Increased Emphasis on Training and Personnel Systems Technologies
23 JAN 1979	Establishment of DoD Technology Advisory/Coordination Groups
10 OCT 1979	Application of Emerging Training and Personnel Systems Technologies
19 OCT 1979	Coordination of People-Related R&D
30 OCT 1979	Simulation and Training Devices Technology
26 NOV 1979	Increasing Demands for Personnel and Training R&D
11 DEC 1979	Navy Manpower, Personnel and Training Research, Development and Studies Program (MPT RD&S)
29 JAN 1981	Effectiveness of U.S. Forces Can Be Increased Through Improved Weapon System Design
12 FEB 1981	The Research and Development Information System (RDIS)
26 AUG 1981	Contractor Incentives to Improve Reliability and Support
18 DEC 1981	Guidelines For Assessing Whether Human Factors Were Considered In The Weapon Systems Acquisition Process
02 MAR 1982	Personal Microprocessor-Based Job Aids
25 FEB 1983	Defense Science Board (DSB) Summer Study on Training and Training Technology
30 AUG 1983	Steering Committee on Training and Training Technology (SECDEF)
10 NOV 1983	Steering Committee on Training and Training Technology (JSC)
01 DEC 1983	Defense Training and Training Technology Data Center (SECDEF)

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3 0 AUG 1983

MEMORANDUM FOR THE CHAIRMAN, OSD STEERING COMMITTEE ON TRAINING
AND TRAINING TECHNOLOGY

SUBJECT: Steering Committee on Training and Training Technology

I have reviewed the Terms of Reference for the OSD Steering
Committee on Training and Training Technology and approve them.
It is quite apparent that the Steering Committee is on the right
track toward implementing the recommendations of the Defense
Science Board on this subject that I endorsed in February 1983.

The Steering Committee should emphasize through the planning,
programming, and budgeting system the importance of adequate
funding and support for programs you identify that will enhance
training effectiveness through the use of technology. It is
particularly important to give high priority to joint-Service
research and development programs. In this regard, the training
data center offers excellent promise and warrants expeditious
development. I cannot overstate the importance of your efforts to
enable the Department to realize significant improvements in the
readiness of our forces and look forward to seeing the results of
your efforts.

43983

JSM- 2613 83
10 NOV 1983

MEMORANDUM FOR THE SECRETARY OF DEFENSE

Subject: Steering Committee on Training and Training
           Technology

1. The OSD Steering Committee held its second meeting on
1 November 1983. The committee received reports from its two
subcommittees and took the actions noted below.

2. The Defense Training Data and Analysis Center Subcommittee
presented, and the Steering Committee approved, the attached
Terms of Reference which had been provided to the Military
Department Assistant Secretaries for Manpower for their comment.
We also agreed to endorse an alterntive which will be included
in Program Budget Decision 216, "Advanced Technology Demonstration,"
allowing the Center to go into operation in FY 1985.

3. The Training Activities Subcommittee presented a list of
candidate training technology areas for consideration by the
committee. We agreed to consider this set of candidates for
special interest and support.

4. The subcommittee presented a briefing on the Joint Operational
Interface Simulation Training System (JOISTS) which is an unfunded,
CINC and JCS validated joint training requirement. The committee
subsequently prepared and submitted an alternative to be included
in Program Budget Decision 260, "Defense Wide Mission Support,"
which if adopted will permit initiation of JOISTS in FY 1985. We
believe this initiative is worthy of your support.

5. The committee directed the Training Center Subcommittee to
accelerate efforts to develop detailed functional, operational
and staffing plans for the Center, and we also tasked the
subcommittee to examine the feasibility of collocating the Center
with the Services' training activities in the Orlando, Florida
area. Finally, the Training Subcommittee was directed to refine
and prioritize the list of candidate training programs and
projects.

5. Recommend you endorse the Steering Committee's actions.

RICHARD L. PRILLAMAN
Lieutenant General, USA
Committee Chairman

Attachment
a/s

2

1 DEC 1983

**MEMORANDUM FOR CHAIRMAN, STEERING COMMITTEE ON TRAINING AND
TRAINING TECHNOLOGY**

SUBJECT: Defense Training and Training Technology Data Center

    I have reviewed your report and agree with the actions
you have taken. I also endorse the Training and Training
Technology Data Center Terms of Reference and your plans to
initiate the Center in FY 1985. One of the next steps should
be to define carefully the organizational requirements and
ensure that the Center is staffed with individuals with the
stature and experience required for this ambitious initiative
to succeed.

    We must continue to identify and pursue opportunities
to enhance training effectiveness and improve the readiness
of our forces. This must be the long-term mission of your
Committee and, eventually, the Training and Training Data
Center. Clearly, you are going in the right direction to
accomplish this objective.

Paul Thayer
Deputy Secretary of Defense

50805